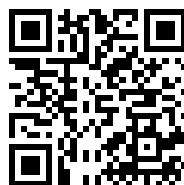
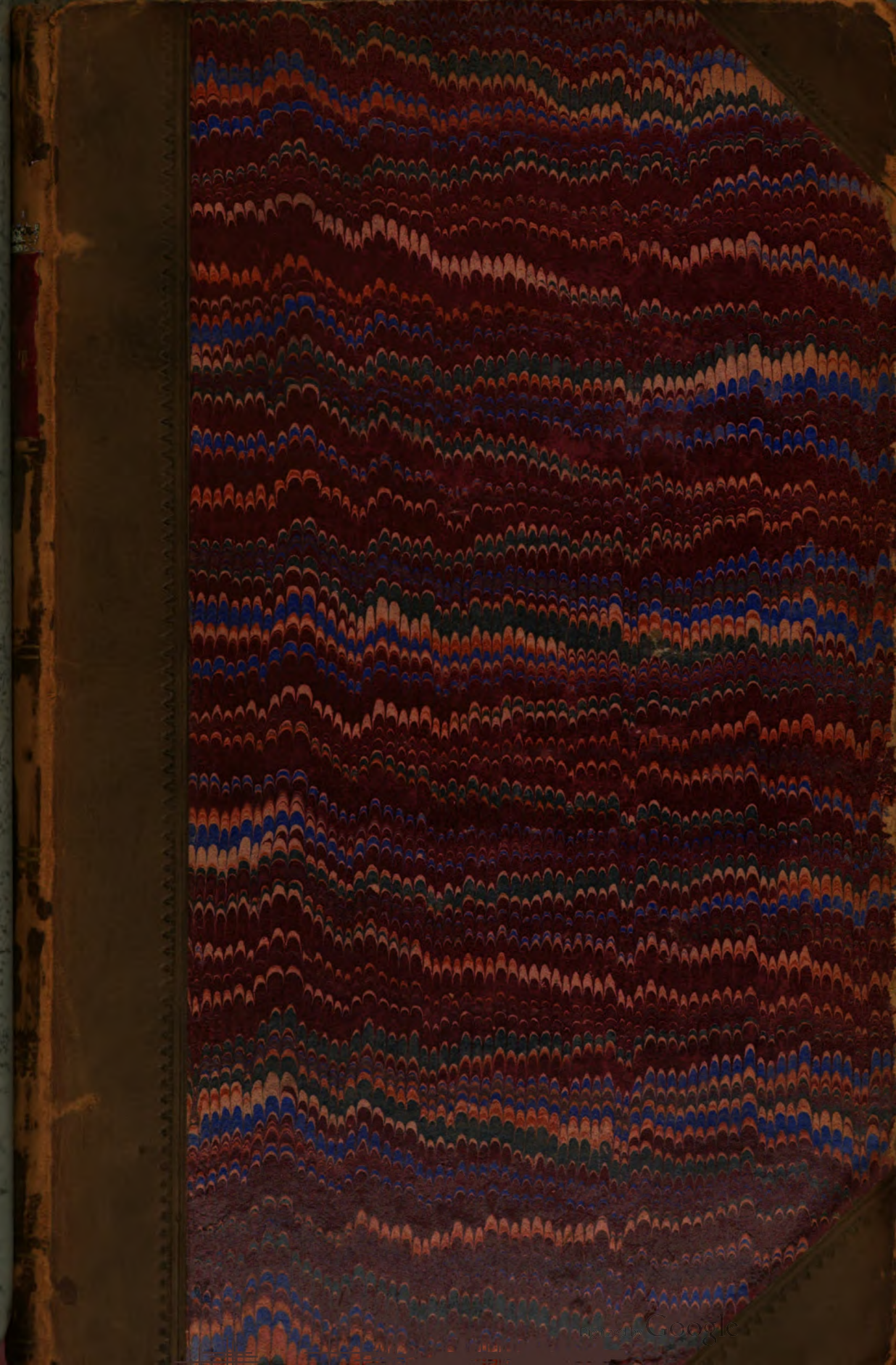
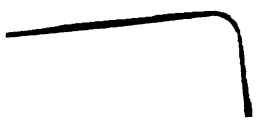

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ARMY MEDICAL DEPARTMENT

REPORT

FOR THE YEAR 1879.

VOLUME XXI.



LONDON:
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FOR HER MAJESTY'S STATIONERY OFFICE.

1881.

TO THE RIGHT HONOURABLE
THE SECRETARY OF STATE FOR WAR.

SIR,

IN accordance with instructions laid down for the conduct of business by the Director-General and Heads of Branches of the Army Medical Department, I have the honour to submit the accompanying Report on the Health of the Army in 1879, and on various matters connected with the duties of the Officers of the Department.

The Statistical, Sanitary, and Medical Reports have been drawn up by the Officers in charge of the respective Branches.

I have the honour to be,

SIR,

Your most obedient

Humble Servant,

W. M. MUIR,

Director-General.

ARMY MEDICAL DEPARTMENT,
1881.

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ARMY MEDICAL DEPARTMENT REPORT FOR 1879.

STATISTICAL REPORT.

THE average annual strength of the troops serving at home and abroad in 1879, as computed from the returns received by the Army Medical Department, was 164,642 non-commissioned officers and men (exclusive of the Royal Malta Fencible Artillery, the 1st and 2nd West India Regiments, and the Gun Lascars at Ceylon, and at Hong Kong, Corps which are not recruited at home); the admissions into hospital in this force were 192,483, and the deaths 3,367. The rates represented by these numbers are for admissions into hospital 1169·1, and for deaths 20·00 per 1,000 of the average annual strength, the latter being calculated on a strength of 168,322, which includes detached men.

The statistics of some of the most important of the results of sickness, in every Command in which the troops were stationed, are exhibited in the following Table:—

1879.

White Troops.	Average Annual Strength.	Admitted into Hospital.	Died.	Sent Home as Invalids.	Discharged as Invalids.	Constantly non-effective from Sickness.
Troops at Home and Abroad	164,642	192,483	3,367	4,479	3,994	8,603·69
United Kingdom -	80,700	66,347	637	—	2,214	3392·69
Gibraltar -	4,516	4,002	45	335	102	225·20
Malta -	4,668	4,073	39	155	67	216·98
Cyprus -	660	970	14	25	39	35·70
Canada -	1,729	1,701	8	57	24	79·03
Bermuda -	1,970	1,175	10	19	42	67·22
West Indies -	1,070	686	11	29	16	34·91
Cape of Good Hope and St. Helena -	12,564	12,263	1,248	1,400	268	696·05
Mauritius -	348	1,059	9	24	13	32·42
Ceylon -	881	1,041	16	25	14	49·55
China and Straits Settlements -	1,876	1,742	13	75	27	100·07
India -	49,537	94,696	1,282	2,335	1,168	3673·87
On board Ship -	4,123	2,728	35	—	—	—

1879.

*Troops at
Home and
Abroad.*

White Troops.	Ratio per 1,000 of Strength.					Average sick-time to each Soldier.	Average duration of each case of Sickness.
	Admitted.	Died.	Sent Home as Invalids.	Discharged as Invalids.	Constantly non-effective from Sickness.		
Troops at Home and Abroad	* 1189·1	† 20·00	‡ 56·11	§ 24·32	53·60	Days. 19·56	Days. 18·55
United Kingdom -	822·1	7·55	—	26·23	42·03	15·34	18·66
Gibraltar -	886·2	9·96	74·16	22·58	49·86	18·20	20·54
Malta -	872·5	8·35	33·20	14·35	46·48	16·97	19·44
Cyprus -	1469·7	21·20	37·86	59·07	54·09	19·74	13·43
Canada -	983·8	4·62	32·95	13·87	45·70	16·68	16·96
Bermuda -	596·4	5·08	9·64	21·31	34·12	12·45	20·88
West Indies -	641·1	10·27	27·10	14·94	32·63	11·91	18·57
Cape of Good Hope and St. Helena -	976·0	99·33	111·43	21·33	55·40	20·22	20·72
Mauritius -	3043·1	25·85	68·96	74·34	93·16	34·00	11·17
Ceylon -	1181·4	19·30	28·39	15·91	56·24	20·53	17·37
China and Straits Settlements -	928·5	6·92	39·97	14·39	53·34	19·47	20·97
India -	1911·6	25·88	47·14	23·58	74·16	27·07	14·16
On board Ship -	661·6	8·49	—	—	—	—	—

* Calculated on strength, excluding men detached (3,680).

† Calculated on strength, including men detached.

‡ Calculated on strength, excluding United Kingdom, and troops on board ship.

§ Calculated on strength, including men detached, and excluding troops on board ship.

|| Calculations exclude men detached and troops on board ship.

1869 to 1878.

Command.	Aggregate strength for 10 years.	Admissions into Hospital.	Deaths.	Men sent to England as Invalids.	Discharged the Service as Invalids.	Average constantly sick.
Troops at Home and Abroad	1,698,700	1,726,884	22,011	30,709	38,660	76,011
United Kingdom -	878,925	709,366	7,769	—	26,044	34,616
Gibraltar -	45,324	29,159	298	1,307	790	1,539
Malta -	49,498	40,389	490	1,416	903	2,043
*Cyprus -	894	3,931	36	135	19	—
Canada -	27,892	16,981	217	526	385	805
Bermuda -	18,990	12,688	198	413	239	629
West Indies -	12,472	11,362	143	241	145	523
Cape of Good Hope and St. Helena -	32,070	30,156	376	635	465	1,455
Mauritius -	4,757	7,840	80	138	51	228
Ceylon -	9,956	10,064	159	362	154	498
China and Straits Settlements -	17,279	22,027	256	807	389	870
India -	578,899	821,583	11,815	24,729	9,076	32,805
On board Ship -	21,744	11,338	174	—	—	—

* For one year only.

1869 to 1878.

*Troops at
Home and
Abroad.*

White Troops.	Ratio per 1,000 of Strength.					Average sick-time to each Soldier.	Average duration of each case of Sickness.
	Admitted.	Died.	Sent Home as Invalids.	Discharged Invalids.	Constantly non-effective from Sickness.		
Troops at Home } and Abroad	1016·6	12·51	38·48	22·25	45·35	16·55	16·21
United Kingdom -	807·1	8·27	—	27·72	39·38	14·37	17·81
Gibraltar -	643·3	6·57	28·84	17·43	33·96	12·39	19·27
Malta -	816·0	9·90	28·61	18·24	41·28	15·07	18·46
Cyprus -	4397·1	40·27	151·01	21·25	—	—	—
Canada -	608·8	7·79	18·56	13·80	28·86	10·53	17·30
Bermuda -	668·1	10·43	21·75	12·59	33·12	12·09	18·10
West Indies -	911·0	11·47	19·32	11·63	41·93	15·31	16·80
Cape of Good Hope and St. Helena -	940·3	11·72	19·80	14·50	45·37	16·56	17·61
Mauritius -	1648·1	16·82	29·01	10·72	47·93	17·49	10·61
Ceylon -	1010·8	15·97	36·36	15·47	50·02	18·26	18·06
China and Straits Settlements -	1280·6	14·82	46·70	22·51	50·35	18·38	14·42
India -	1419·2	20·41	42·72	15·68	56·67	20·68	14·57
On board Ship -	521·4	8·00	—	—	—	—	—

II.—ON THE HEALTH OF THE TROOPS SERVING IN THE UNITED KINGDOM.

Sickness and Mortality.

STATISTICAL REPORT.

United Kingdom.

The average annual strength of the non-commissioned officers and men serving in the United Kingdom during the year, calculated from the returns received from the Medical Officers, was 80,700; the admissions into hospital in this number were 66,347, being in the rate of 822·1 per 1,000; there were 553 deaths amongst the men present with their corps, and 84 deaths amongst men detached (the average number of whom is given in the Adjutant-General's return as 3,680); the death-rate of the non-commissioned officers and men is therefore 7·55 per 1,000 of the strength.

Compared with the preceding year, the rate of admissions is 9·7 per 1,000 men higher, and the death-rate is 1·02 per 1,000 higher.

The classes and orders of diseases to which the admissions and deaths were due are shown in Abstract No. 1.

GENERAL DISEASES.—*Febrile Group.*—4,026 admissions are shown for diseases of this group, giving a ratio of 49·8 per 1,000 of the strength, which when compared with that for the preceding year shows an increase of 8·6 per 1,000. 33 deaths are returned, or a ratio of ·39 per 1,000, which is ·04 per 1,000 lower than that for last year.

Constitutional Group.—The total number returned under this heading amounts to 11,780. The rate of admissions is 146·0 per 1,000, which is 2·6 lower than that for last year. The number of deaths was 255, or a ratio of 3·02 per 1,000 men, which when compared with the rate for the preceding year shows an increase of ·94 per 1,000.

LOCAL DISEASES.—The rates of admissions for diseases of the *nervous, respiratory, urinary, and cutaneous systems*, and those of the *ear* are higher than for the preceding year, while a decrease is observed for those of the *circulatory, absorbent, digestive, generative, and locomotive systems*, and for diseases of the *eye, and cellular tissue*. The difference in the two years is small in all instances, except for diseases of the respiratory system, where it is 20 per 1,000 higher, due no doubt to the severity of the winter. The death rates are lower than in the preceding year for diseases of the *nervous and circulatory systems*, and for the *organs of locomotion*, but higher for those of the *respiratory, digestive, and urinary systems*, and for diseases of the *cellular tissue*. There was no death in the other groups of local diseases in either year. The highest rate of mortality is observed in the respiratory group, where it is 1·62 per 1,000 men, or ·53 per 1,000 higher than in the previous year.

CONDITIONS, &c.—*Debility.*—The rate of admissions is 1·7 per 1,000 men lower than that for last year.

POISONS.—The rate of admissions is ·6 per 1,000 of the strength lower than last year's. There were two cases of *suicide* caused by cyanide of potassium.

INJURIES.—The rates of admissions for *general* and *local injuries* combined is 8·4 per 1,000 lower than for last year. 33 of the admissions were for *self-inflicted* injuries, and 15 of the deaths were *suicidal*. The admissions for *self-inflicted* injuries are returned as multiple injury (2), cut-throat (21), wounds of the hand (2), gunshot wounds (8). The *suicidal* deaths are shown as, multiple injuries (4), asphyxia by hanging (3), cut-throat (4), gunshot wound (4).

United Kingdom.

The admissions, deaths, and average number constantly sick in the various Military Districts are shown in the following Table :—

Military Districts.	Average Annual Strength.	Admitted into Hospital.	Died.	Average Number constantly Sick.	Ratio per 1,000 of Mean Strength.			Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.
					Admitted.	Died.	Constantly Sick.		
1. Northern -	7,993	7,033	81	331·70	879·9	10·13	41·50	15·15	17·21
2. Eastern -	3,879	3,188	40	168·79	821·8	10·31	43·51	15·88	19·32
3. Western -	4,853	3,438	35	189·21	708·4	7·21	38·98	14·23	20·09
4. Southern -	7,453	6,633	51	365·32	890·0	6·84	49·02	17·89	20·10
5. Chatham -	4,135	3,692	21	190·71	892·8	5·08	46·12	16·83	18·85
6. South-eastern -	6,871	5,480	39	286·61	797·6	5·68	41·71	15·22	19·09
7. Home -	7,022	6,215	50	329·23	885·1	7·12	46·88	17·11	19·34
8. Woolwich -	5,402	4,037	33	216·33	747·3	6·11	40·04	14·62	19·56
9. Aldershot -	11,019	7,836	64	413·62	711·1	5·85	87·54	13·70	19·27
10. North British -	3,334	2,681	32	137·04	804·1	9·60	41·10	15·00	18·66
11. Channel Islands	1,324	1,505	7	60·27	1136·7	5·28	45·52	16·62	14·62
12. Belfast -	2,136	2,110	14	86·53	987·8	6·55	40·51	14·79	14·97
13. Dublin -	9,139	7,345	47	390·54	803·7	5·14	42·73	15·60	19·41
14. Cork -	6,140	5,154	39	226·79	839·4	6·35	36·94	13·48	16·06
Detached from their Corps.	3,680	—	84	—	—	22·83	—	—	—
Total -	84,380	66,347	637	3392·69	822·1	7·55*	42·03	15·34	18·66
„ 1869-78	—	—	—	—	807·1	8·36	39·38	14·37	17·81

The Channel Islands District (which gave the second highest rate last year) furnishes the highest rate of admissions, and exceeds that of the Belfast District, the next highest, by 148·9 per 1,000 of the strength, and that of the

* Calculated on strength including men detached.

United Kingdom.

Western, where the rate is lowest, by 428·3 per 1,000. The Northern, Southern, South-eastern, North British, Channel Islands, Belfast, and Cork Districts give higher rates of admission than last year, and the Eastern, Western, Home, Woolwich, Aldershot, and Dublin lower. The Chatham District shows the lowest rate of mortality (5·08 per 1,000), and the Northern the highest (10·13 per 1,000). The Southern District furnishes the highest proportion constantly sick, the longest average sick time to each soldier, and the longest average duration of each case of sickness. Cork gives the lowest proportion constantly sick, and the shortest average sick time to each soldier, and the average duration of each case of sickness is shortest in the Channel Islands.

The results of sickness in the four permanent Camps (which are included in the first Table) are separately grouped in the following one:—

—	Average Annual Strength.	Admitted into Hospital.	Died.	Average Number constantly Sick.	Ratio per 1,000 of Mean Strength.			Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.
					Admitted.	Died.	Constantly Sick.		
Camps -	17,489	13,380	117	696·18	765·1	6·69	39·81	Days. 14·53	Days. 18·99

The rates of admissions and deaths are respectively 9·6 and 1·94 per 1,000 men higher than in the preceding year; and the constantly sick rate is 1·71 lower.

The admissions and deaths in each class and order of diseases are shown by Districts in Abstracts No. 1, A, B, C, D, E, F, G, H, I, J, K, L, M, N.

GENERAL DISEASES.—Compared with the preceding year the rate of admissions for diseases of this class is higher for the Northern District by 15·2, for the Eastern by 24·3, for the Southern by 18·4, for the South-eastern by 42·5, for Woolwich by 47·5, for the North British by 16·4, for the Channel Islands by 31·8, for Belfast by 97·3, and for Cork by 18·1 per 1,000. The rates are lower for the Western District by 24·0, for the Chatham by 7·9, for the Home by 69·2, for Aldershot by 16·9, and for the Dublin District by 15·7 per 1,000.

Febrile Group.—Eruptive Fevers.—The rate of admissions for all Districts combined is 4·9 per 1,000, which is ·7 per 1,000 higher than that for last year. It is higher for the Western, South-eastern, Home, Woolwich, Aldershot, and North British Districts, and lower for all others. The South-eastern, Home, and Aldershot give the highest rates, due in the first-mentioned chiefly to cow pox, in the Home to scarlet fever, in the 1st Life Guards and in Aldershot to measles and scarlet fever. The admissions for small-pox were only 6, at Aldershot 1, and at Dublin 5. Measles, of which there were 163 cases, occurred in every District except Belfast and the Channel Islands; its greatest prevalence was in the Woolwich, Aldershot, Southern, and Western Districts, in which the admissions were respectively, 43, 31, 25, and 24. Admissions for scarlet fever occurred in all Districts excepting Woolwich and the Channel Islands; of the 100 admissions, 20 were in the Cork District, 19 in the Aldershot, 14 in the Dublin, and 13 in the Home District.

Continued Fevers.—1,285 admissions are shown under this heading for all Districts together, giving a ratio of 15·9 per 1,000 of the strength, which is 4·1 per 1,000 lower than that for last year. Lower rates are observed for the Northern District by ·4 per 1,000, for the Eastern by 15·3, for the Western by 12·8, for the Southern by 6·6, for the Chatham by 6·7, for the Home by 2·3, for the Woolwich by 11·8, for the North British by 5·3, for the South-eastern by 1·9, for the Belfast by 3·1, for the Dublin by 4·8, for the Cork by 3·3. Aldershot gives a higher rate than last year by ·6 per 1,000, and the

Channel Islands by 34·7. The high rate for the Channel Islands is due to a large number of admissions at St. Peter's, Jersey, for febricula. *United Kingdom.*

Typhus Fever.—There were 4 admissions and 3 deaths from this form of fever, one admission and one death occurring in London, in a man of the Coldstream Guards, the other cases occurred in Ireland at Belfast, Athlone, and Cork.

Enteric Fever.—There were 107 admissions for this form of fever, being in the ratio of 1·33 per 1,000 of the strength, which is ·22 per 1,000 higher than that for last year. The number of deaths was 18, giving a ratio of ·21 per 1,000 which is ·01 per 1,000 lower than last year's. Of the admissions, 5 took place in the Northern District, 2 in the Eastern, 8 in the Western, 7 in the Southern, 2 in the South-eastern, 7 in the Home, 1 in the Woolwich, 9 in the Aldershot, 3 in the North British, 1 in the Belfast, 13 in the Dublin, and 49 in the Cork. The proportions of deaths to those attacked was 168·22 per 1,000 against 205·4 in the preceding year, or a lower rate of mortality by 37·2 per 1,000. The type of the disease would seem to have been particularly mild in the Cork District only 4 deaths occurring out of 49 cases; it was chiefly confined to Fermoy and Cork, the outbreak in the latter stations having been clearly traced to importation from the former. The Chatham and Channel Islands Districts had an entire immunity from the disease.

Simple Continued Fever.—214 admissions are returned under this heading, giving a ratio of 2·65 per 1,000. Two deaths are shown as due to this disease, one occurred in the South-eastern District at Dover, and one in the Northern District at Leeds. Febricula gave 959 admissions, or a rate of 11·88 per 1,000 for all Districts together. It is lower by 3·58 per 1,000 than for the preceding year. There was no death.

Paroxysmal Fevers.—1,391 admissions are returned for fevers of this kind, giving a ratio of 17·2 per 1,000 men for all Districts together, which is 9·1 per 1,000 higher than for last year. Ague was the cause of admission in all but 21 instances, which are shown as remittent fever. The rate is higher than in the preceding year, for the Northern District by 4·5 per 1,000 men, for the Eastern by 21·6, for the Western by 5·8, for the Southern by 20·1, for the Chatham by ·1, for the South-eastern by 22·2, for the Woolwich by 12·5, for the Aldershot by 1·7, for the North British by 22·5, for the Channel Islands by 1·6 for the Belfast by 10·5, for the Dublin by 2·3, for the Cork by 13·5 per 1,000; it is lower only in the Home District, where the reduction is but ·3 per 1,000. The Southern District gives the highest rate (42 per 1,000) due no doubt, as in last year, to the force being mainly made up of troops recently arrived from foreign service. There was no death.

Other diseases of this group caused 955 admissions, the bulk of them being for influenza, which as in previous years was most rife at Woolwich, where 453 cases are returned.

Rheumatism.—3,279 is the total number of cases shown under this heading for all Districts together, giving a ratio of 40·6 per 1,000, which is 6·1 per 1,000 lower than for last year. The ratio is lower than in 1878, for the Eastern District by 4·0 per 1,000 men, for the Western by 18·3, for the South-eastern by 16·2, for the Home by 8·8, for the Woolwich by 3·0, for the Aldershot by 18·0, for the North British by 3·2, for the Channel Islands by 12·8, and for the Dublin by 6·5 per 1,000. Higher rates are observed for the Northern District by ·1, for the Southern by 9·7, for the Chatham by ·9, and for the Belfast by 9·5 per 1,000, while for the Cork District the rates are identical in each year.

Syphilis.—For all Districts together 5,113 admissions are shown for primary, and 2,341 for secondary syphilis, giving ratios respectively of 63·4 and of 29·0 per 1,000 of the strength. The rate for both combined is 92·4 per 1,000, which is in excess of that for last year by 4·4 per 1,000.

In continuation of the statistical information given in the reports of previous years, the admissions for primary venereal sores and gonorrhoea at certain large

*United
Kingdom.*

stations in the United Kingdom, and their rates per 1,000 of the average annual strength, are shown in the following Table :—

Stations under the Act.

Stations.	Average Annual Strength.	Admitted for Primary Venereal Sores.	Admitted for Gonorrhœa.	Ratio per 1,000 of the Strength admitted for Primary Venereal Sores.	Ratio per 1,000 of the Strength admitted for Gonorrhœa.
Devonport and Plymouth -	2,210	74	195	33	88
Portsmouth -	4,127	110	290	27	70
Chatham, Sheerness, and Gravesend.	4,185	209	326	51	79
Woolwich -	5,320	234	274	44	52
Aldershot -	11,019	622	964	56	87
Windsor -	1,023	47	72	46	70
Shorncliffe -	2,339	159	121	68	52
Colchester -	1,984	73	81	37	41
Winchester -	1,049	24	66	23	63
Dover -	2,561	93	145	36	57
Canterbury -	1,211	41	83	34	69
Maidstone -	156	8	3	19	19
Cork -	2,275	67	106	29	47
Curragh -	3,237	249	213	77	66
Total of 14 stations under the Act - }	42,646	2,005	2,939	47	69

Stations *not* under the Act.

Stations.	Average Annual Strength.	Admitted for Primary Venereal Sores.	Admitted for Gonorrhœa.	Ratio per 1,000 of the Strength admitted for Primary Venereal Sores.	Ratio per 1,000 of the Strength admitted for Gonorrhœa.
Isle of Wight -	887	50	45	56	51
London -	4,284	743	491	173	115
Warley -	440	53	24	120	55
Hounslow -	751	14	18	19	24
Pembroke Dock -	862	13	36	15	42
Sheffield -	689	91	139	132	202
Manchester -	825	169	100	205	121
Preston -	666	38	79	57	119
Edinburgh -	1,188	95	131	80	110
Fermoy -	811	27	68	33	84
Limerick -	755	21	46	28	61
Athlone -	647	10	34	15	53
Dublin -	4,477	523	422	117	94
Belfast -	776	96	86	124	111
Total of 14 stations <i>not</i> under the Act - }	18,058	1,943	1,719	108	95

Stations.	Rate of Admissions into Hospital per 1,000 of Mean Strength for Primary Venereal Sores in—													United Kingdom.
	1867.	1868.	1869.	1870.	1871.	1872.	1873.	1874.	1875.	1876.	1877.	1878.	1879.	
Devonport and Plymouth.	76	86	74	58	50	59	37	36	29	27	28	34	33	
Portsmouth	116	86	62	51	41	40	44	46	30	27	27	15	27	
Chatham and Sheerness.	71	63	41	47	65	49	41	33	17	33	43	49	51	
Woolwich -	88	46	52	43	58	60	60	47	59	42	29	38	44	
Aldershot -	81	77	63	67	65	62	72	52	46	47	46	53	56	
Windsor -	58	136	95	67	78	96	84	63	41	41	80	39	46	
Shorncliffe	42	77	60	100	30	33	21	14	18	22	21	41	68	
Colchester	145	182	85	42	32	55	42	20	32	30	52	19	37	
Winchester	52	104	101	61	29	57	27	38	27	20	18	38	23	
Dover -	132	111	80	30	24	47	38	37	27	30	19	31	36	
Canterbury	119	114	45	152	38	43	20	36	12	27	19	27	34	
Maidstone	242	122	128	68	44	57	59	66	7	28	34	7	19	
Cork -	72	61	73	68	55	62	61	26	21	21	16	36	29	
Curragh -	104	85	88	56	35	50	30	46	35	18	38	54	77	
Isle of Wight	59	103	129	64	66	57	37	89	89	54	51	50	56	
London -	163	148	144	160	190	199	185	179	187	146	166	250	173	
Warley -	74	92	61	55	57	66	22	32	37	51	59	140	120	
Hounslow -	62	106	85	88	45	90	67	68	24	75	48	40	19	
Pembroke Dock.	28	35	51	54	28	27	25	21	31	29	16	12	15	
Sheffield -	163	107	146	77	126	98	71	49	87	119	64	96	132	
Manchester	177	115	160	92	70	98	91	106	89	113	131	206	205	
Preston -	87	87	172	134	75	114	123	97	57	77	77	73	57	
Edinburgh	63	46	60	99	69	43	44	25	27	89	47	72	80	
Fermoy -	70	47	116	89	33	56	21	10	12	31	29	26	33	
Limerick -	117	114	54	136	57	100	78	58	25	47	75	85	28	
Athlone -	85	38	42	44	47	14	14	8	10	8	35	29	15	
Dublin -	129	139	180	128	117	165	136	95	73	76	103	154	117	
Belfast -	89	56	52	43	61	78	103	64	44	57	43	66	124	

The group of 14 stations under the Act shows an increase of 7 per 1,000 men on the corresponding rate of the preceding year; the contrasted group of 14 stations not under the Act shows a decrease of 23 per 1,000 men.

The results obtained by a different grouping of the stations in the United Kingdom are shown in the following Table:—

* In October 1873 a Royal Warrant was promulgated, directing that soldiers admitted into hospital on account of venereal disease should forfeit their pay whilst under treatment. This Warrant was cancelled by another dated 27th November 1879.

United Kingdom.

Groups.	Average Annual Strength.	Admissions into Hospital for Primary Venereal Sores.	Ratio per 1,000 of the Strength of Admissions for Primary Venereal Sores.
The 14 stations under the Contagious Diseases Act.	42,646	2,005	47
All other stations -	38,054	3,108	82
Total -	80,700	5,113	63

No admissions for this disease are returned at 24 stations having an aggregate average annual strength of 1,313 men.

TABLES relating to the CONTAGIOUS DISEASES ACTS, as regards the ARMY, contrasting the Results at 28 Large Stations in the United Kingdom, being all at which the Force was 500 Men and upwards, when the first Act was applied.

I.—TABLES showing the Admissions into Hospital for Primary Venereal Sores and for Gonorrhœa at 28 Stations of Troops in the United Kingdom, from 1860.

Year.	The Fourteen Stations successively brought under the Acts.						Fourteen Large Stations not under the Acts.					
	Average Annual Strength.	Admissions into Hospital for Primary Venereal Sores.	Admissions into Hospital from Gonorrhœa.	Ratio per 1,000 of the Strength.	Primary Venereal Sores.	Gonorrhœa.	Average Annual Strength.	Admissions into Hospital for Primary Venereal Sores.	Admissions into Hospital from Gonorrhœa.	Ratio per 1,000 of the Strength.	Primary Venereal Sores.	Gonorrhœa.
1860 - - -	57,479	8,405	7,960	146	139	17,114	2,292	2,374	134	139		
1861 - - -	51,328	7,267	7,138	142	139	17,126	2,049	2,023	120	118		
1862 - - -	45,322	5,314	6,283	117	139	15,026	1,500	2,070	100	133		
1863 - - -	43,419	4,653	5,202	107	120	15,132	1,612	1,816	107	120		
Totals for 4 years -	197,548	25,639	26,584	—	—	64,402	7,453	8,283	—	—		
Average for 1860-63 -	49,387	6,410	6,646	130	135	16,100	1,863	2,071	116	129		
1864 - - -	40,694	4,135	4,803	102	118	14,894	1,647	1,636	111	110		
1865 - - -	43,078	4,077	4,937	95	115	14,091	1,418	1,968	101	140		
1866 - - -	39,476	3,444	4,573	87	116	14,595	1,154	1,663	79	114		
1867 - - -	39,911	3,640	5,274	91	132	20,580	2,372	2,670	115	130		
1868 - - -	42,595	3,533	5,685	83	133	19,486	2,130	2,236	109	115		
1869 - - -	42,017	2,765	4,406	66	106	17,739	2,273	1,856	128	105		
Totals for 6 years -	247,771	21,594	29,738	—	—	101,394	10,994	12,029	—	—		
Average for 1864-69 -	41,295	3,599	4,956	87	120	16,899	1,832	2,005	108	119		
1870 - - -	41,580	2,268	4,081	55	98	17,852	2,022	1,723	113	96		
1871 - - -	54,096	2,763	6,254	51	116	19,967	1,865	2,137	93	107		
1872 - - -	50,794	2,752	5,280	54	104	19,950	2,457	2,113	123	106		
1873 - - -	48,039	2,420	3,946	50	82	19,801	2,025	1,888	102	96		
1874 - - -	48,136	2,039	2,968	42	62	18,879	1,661	1,450	88	77		
1875 - - -	48,606	1,717	2,825	35	58	19,573	1,552	1,405	79	72		
1876 - - -	48,620	1,622	3,302	33	68	18,790	1,554	1,677	82	89		
1877 - - -	52,422	1,809	3,585	35	68	19,076	1,730	2,234	91	117		
1878 - - -	55,813	2,235	4,352	40	78	20,719	2,723	2,508	131	121		
1879 - - -	42,646	2,005	2,939	47	69	18,058	1,943	1,719	103	95		
Totals for 10 years -	430,752	21,630	39,532	—	—	192,685	19,532	18,854	—	—		
Average for 1870-79 -	49,075	2,163	3,953	44	80	19,268	1,953	1,885	101	97		

N.B.—For the years 1860-66, inclusive, Windsor has been omitted from the group of stations under the Act, and London from that *not* under the Act, as the returns for those years do not afford the necessary information.

II.—TABLES showing the Number of Men always in Hospital with Primary Venereal Sores at 28 Stations, for Troops in the United Kingdom, in each Year, from 1870 to 1879, inclusive. *United Kingdom.*

Year.	Under the Act.			Not under the Act.		
	Average Annual Strength.	Constantly in Hospital with Primary Venereal Sores.	Ratio per 1,000 of the Strength.	Average Annual Strength.	Constantly in Hospital with Primary Venereal Sores.	Ratio per 1,000 of the Strength.
1870	41,580	186	4·46	17,852	174	9·74
1871	54,096	210	3·89	19,957	161	8·07
1872	50,794	232	4·56	19,950	225	11·29
1873	48,039	214	4·45	19,801	175	8·86
1874	48,136	150	3·11	18,879	130	6·89
1875	48,606	129	2·66	19,573	115	5·88
1876	48,620	120	2·47	18,700	112	5·94
1877	52,422	137	2·61	19,076	119	6·23
1878	55,813	175	3·14	20,749	185	8·90
1879	42,646	154	3·61	18,058	149	8·25
Total	490,752	1,707	—	192,685	1,545	—
Average for 10 years	49,075	171	3·48	19,268	155	8·04

For the four years (1860–63) preceding that in which the first Contagious Diseases Act was passed, the average rate of prevalence of primary venereal sores at a group of stations, each of which was successively placed under the Act, is 130, and that for gonorrhœa is 135 per 1,000 of the strength. At another group of 14 stations (originally selected for comparison because at the time the stations comprised in it were large ones, that is, had not less than 500 men) the rate of prevalence of primary venereal sores is 116, and that for gonorrhœa is 129 per 1,000 of the strength.

In the next period shown (1864–69) the Act was applied successively at each of the stations in the subjected group; in 1865 it was in operation at three stations, in 1866 at four, in 1867 at five, in 1868 at eight, in 1869 at 10, in 1870 it was in operation at all the 14 stations. During this period the average rate of prevalence of primary venereal sores fell to 87 per 1,000 of the strength, in the subjected group; in the contrasted group of large stations it fell to 108 per 1,000 of the strength. The result, therefore, is that the subjected group of stations which before the application of the Act had a rate of prevalence 14 per 1,000 higher than the unsubjected group, for the period of its partial application, has a rate of prevalence 21 per 1,000 lower than that of the unsubjected group.

In the third period shown (1870–79) the Act was in force for the whole time at every one of the stations in the subjected group, and the average rate of prevalence of the disease fell to 44 per 1,000 men, an average rate identical with that for the period 1870 to 1878: at the unsubjected group the rate fell to 101 per 1,000 men, an average rate identical with that for the period from 1870 to 1878.

The rate of prevalence of gonorrhœa in the first years of the application of the Act did not materially differ in the two groups of stations; in the last years, however, the results are favourable for the subjected group, the rate of which in 1879, is nearly a third lower than that of the unsubjected one.

In Table II. the average number of men always in hospital on account of primary venereal sores at each of the groups of stations for the years 1870–79 is shown. The average rate of the subjected group is less than the half of that of the other.

Tubercular Diseases.—For all Districts together there were 900 admissions for tubercular diseases, giving a ratio of 11·2 per 1,000 of the strength, which is lower by ·8 per 1,000 than that for last year. 235 deaths are recorded, or a ratio of 2·78 per 1,000, which is ·94 per 1,000 higher than last year's. All the mortality, except in 6 instances was due to phthisis pulmonalis. It is worthy of remark that more than one third of the deaths amongst the troops in the whole United Kingdom is due to this dreadful disease. Compared with the preceding year higher rates are observed for the Northern, Western, South-eastern,

United Kingdom.

Channel Islands, and Belfast Districts, and lower for the Eastern, Southern, Chatham, Home, Woolwich, Aldershot, North British, Dublin, and Cork Districts. The highest rate is given by the Belfast District, where it is 16·9 per 1,000, the lowest by Aldershot where it is 7·1 per 1,000.

LOCAL DISEASES.—*Diseases of the Nervous System.*—For diseases of this system, there were 955 admissions in the whole of the United Kingdom, giving a ratio of 11·8 per 1,000 men, which is almost identical with that for the previous year. There were 33 deaths being in the ratio of ·39 per 1,000, which is lower by ·13 per 1,000 than last year's. Compared with 1878 higher rates of admission are observed for the Northern, Western, Chatham, South-eastern, North British, and Belfast Districts, and lower for all others. The highest rate 22·5 per 1,000 is given by Belfast, the lowest 8·3 per 1,000 by Aldershot.

Diseases of the Eye.—For all Districts together 1,128 admissions are returned for affections of this organ, being in the ratio of 14·0 per 1,000, which is 2·1 per 1,000 lower than that for last year. The highest rate 19·2 per 1,000 is given by the South-eastern District, the lowest 7·2 per 1,000 by the North British. In the preceding year the rate was highest for the Eastern District, and lowest for the Channel Islands.

Diseases of the Circulatory System.—For the whole of the United Kingdom the total number of cases returned is 1,056. The rate of admissions is 13·1 per 1,000 of the strength, or 3·9 per 1,000 lower than for last year. The rates are higher than in the preceding year for the Northern, Home, North British, and Belfast Districts, but lower for all others.

Diseases of the Respiratory System.—For all Districts together there were 7,818 admissions for affections of the respiratory system, being in the ratio of 96·9 per 1,000 of the strength, which is 20 per 1,000 higher than that for last year. The rates are higher than in the preceding year for the Northern, Eastern, Southern, Chatham, South-eastern, Home, Aldershot, North British, Belfast, Dublin, and Cork Districts, and lower for the Western, Woolwich, and Channel Islands Districts. The highest rates are given by the Southern, and Eastern Districts, which are respectively, 131·1 and 126·8 per 1,000 of the strength, the lowest by the Woolwich, and Western Districts, which are respectively 53·3 and 72·1 per 1,000.

Diseases of the Digestive System.—For all Districts together there were 8,257 admissions, being in the ratio of 102·3 per 1,000 of the strength, or 2·0 per 1,000 lower than last year's. Higher rates are observed than in the preceding year for the Northern, Southern, Chatham, South-eastern, Channel Islands, Belfast, and Cork Districts, and lower for all others. The highest rate 144·2 per 1,000 is given by the Southern District, the lowest, 80 per 1,000, by Aldershot.

Diseases of the Urinary System.—For the whole United Kingdom 6,157 admissions are shown for gonorrhœa, 874 for sequelæ of gonorrhœa, and 820 for other diseases of this system. The rate for all combined is 97·3 per 1,000, which is higher fractionally than that for last year. Higher rates are observed for the Northern, Southern, Chatham, South-eastern, Aldershot, North British, Channel Islands, Belfast, and Cork Districts than in the preceding year, and lower for all others. The highest rate, 213·7 per 1,000, is given by the Channel Islands, the lowest 73·7 by the South-eastern District.

The admissions into hospital for gonorrhœa, at specified groups of stations in the United Kingdom, are shown in the following Table:—

Groups.	Average Annual Strength of the Group.	Admissions into Hospital for Gonorrhœa.	Ratio per 1,000 of the Strength of Admissions for Gonorrhœa.
The 14 stations under the Contagious Diseases Act	42,646	2,939	69
At 14 large stations not under the Contagious Diseases Act	18,058	1,719	95
All stations together not under the Contagious Diseases Act (excluding the 14 large stations) - -	19,996	1,499	70
Total - -	80,700	6,157	76

Diseases of the Cutaneous System.—The number of admissions for all Districts together was 8,960, giving a ratio of 111 per 1,000 of the strength, which is 2·4 per 1,000 higher than last year's. The rates are higher than in the preceding year for the Southern, Chatham, South-eastern, North British, Channel Islands, Belfast, Dublin, and Cork Districts, and lower for all others. *United Kingdom.*

Poisons.—The admissions for the whole of the United Kingdom amounted to 147, or a ratio of 1·8 per 1,000, which is ·6 per 1,000 lower than that for 1878. The highest rate (9·8 per 1,000) is given by the Eastern District, the lowest by Woolwich, Aldershot, and Dublin, each of which gives a rate of ·4 per 1,000 only. In the preceding year the Channel Islands gave the highest rate.

INJURIES.—The rates of admissions are lower than in 1878 for the Northern, Eastern, Western, Southern, Home, Woolwich, Aldershot, North British, and Dublin Districts, and higher for all others.

The following Table, compiled from the Principal Medical Officer's Returns, shows the admissions, deaths, number of men invalided, and number constantly sick, from each arm of the service, with the rates per 1,000 of the strength and the corresponding rates for the 10 years previous :—

Arms of the Service.	Average Strength.	Admitted into Hospital.	Died in and out of Hospital.	Discharged as Invalids.	Average Number constantly Sick.	Annual Ratio per 1,000 of Strength.				1869-78.—Annual Ratio per 1,000 of Strength.			
						Admitted.	Died.	Invalided.	Constantly Sick.	Admitted.	Died.	Invalided.	Constantly Sick.
Household Cavalry	1,206	773	2	22	31·53	641·0	1·66	18·24	26·14	621·5	6·72	15·51	26·94
Cavalry	10,074	9,172	55	304	455·53	910·5	5·46	30·16	45·22	826·0	6·94	32·64	40·41
Royal Artillery	16,532	12,096	130	476	637·72	731·7	7·86	28·79	38·57	875·7	9·38	29·34	43·24
Royal Engineers	2,748	1,494	17	52	74·29	543·7	6·19	18·92	27·03	*631·9	7·04	17·90	†
Foot Guards	5,677	5,078	43	139	274·37	894·5	7·57	24·48	48·33	779·1	7·95	23·31	42·95
Infantry Regiments, including Depôts.	32,418	28,284	222	804	1455·87	872·5	6·85	26·65	44·91	737·3	7·73	27·52	34·47
Brigade Depôts	8,754	7,433	130	307	325·84	849·1	14·82	35·17	37·22	965·1	11·58	48·95	41·37
Garrison Staff and Departments.	3,712	2,026	38	50	90·61	545·8	10·24	13·47	24·41	*542·5	9·65	16·89	†

* For two years only.

† This information cannot be given.

The annual admission rates per 1,000 of the strength are lower than in 1878 in the Foot Guards by 94·7, Royal Engineers by 79·7, Cavalry by 67·1, Garrison Staff and Departments by 61·7, and in the Royal Artillery by 34·5; they are higher than in 1878 in the Brigade Depôts by 96·3, Infantry Regiments by 55·8, in the Household Cavalry by 25·6.

The annual death-rates per 1,000 of the strength are higher than in 1878 in the Brigade Depôts by 4·31, Garrison Staff and Departments by 2·64, Foot Guards by 1·41, Royal Artillery by ·67, Infantry Regiments by ·54, and in the Cavalry by ·31; they are lower in the Household Cavalry by 1·66, and in the Royal Engineers by ·08.

The annual rates of invaliding per 1,000 of the strength are lower than in 1878 in the Cavalry by 18·22, the Household Cavalry by 17·47, Infantry Regiments by 8·79, Foot Guards by 6·68, Royal Engineers by 4·73, Garrison Staff and Departments by 4·13, and the Royal Artillery by 4·01, and higher in the Brigade Depôts by ·27.

In the following Table, to the strength of each arm one half of the number of men belonging to it who were placed on the pension list during the year has been added, and to the mortality of the arm the deaths occurring before the 31st December among the men pensioned from it :—

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	1879.			1869-78.
	Average Strength corrected as above.	Deaths of Soldiers and Pensioners.	Ratio of Deaths per 1,000 of the Strength.	Ratio of Deaths of Soldiers and Pensioners per 1,000 of the Strength.
Household Cavalry -	1,221	2	1.64	8.29
Cavalry -	10,298	62	6.02	7.74
Royal Artillery -	17,113	151	8.82	9.49
Royal Engineers -	2,851	21	7.37	6.93
Foot Guards -	5,761	49	8.51	9.25
Infantry Regiments -	33,379	254	7.61	8.65
Brigade Depôts -	8,768	130	14.83	10.77
Garrison Staff and Departments -	3,866	40	10.35	—
Total -	83,257	709	8.52	8.73

Compared with the death rate of soldiers and pensioners for 1878 an increase is observed in the mortality of every arm of the service, except in the Household Cavalry. As the Garrison Staff and Departments were not included in the Table published last year, no comparison can be made respecting them.

VACCINATION.

The following Table shows the condition, as to vaccination, of recruits found fit for the service on primary inspection by Army Medical Officers. No information is available respecting those primarily inspected by Civil Medical Practitioners :—

	Number of Recruits found fit for the Service.	Ratio per 1,000
Had marks of vaccination -	21,431	913.9
Had marks of small-pox -	874	37.3
Had neither marks of vaccination nor small-pox -	1,144	48.8
Total -	23,449	1000.0

Compared with the returns for 1878, this table shows a slight increase in the proportions of recruits who had neither marks of vaccination, nor of small-pox, also of those who had marks of vaccination, and a decrease in the proportion of those who had marks of small-pox.

The following Table, compiled from the Annual Returns, shows the number of soldiers vaccinated during the year, with the proportions per 1,000 of successful vaccinations and failures, when vaccinated with fresh or preserved lymph :—

Results.	Vaccinated during the period.					
	Arm to arm.		From Preserved Lymph.		Total.	
	Primary Vaccination.	Re-vaccination.	Primary Vaccination.	Re-vaccination.	Primary Vaccination.	Re-vaccination.
A perfect vaccine pustule.	55	3,221	111	4,752	166	7,973
A modified vaccine pustule.	23	3,321	61	4,643	84	7,964
A failure in -	15	1,053	37	4,070	52	5,123
Total -	93	7,595	209	13,465	302	21,060

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Results.	Proportions per 1,000.					
	Arm to arm.		From Preserved Lymph.		Total.	
	Primary Vaccination	Re-vaccination.	Primary Vaccination.	Re-vaccination.	Primary Vaccination.	Re-vaccination.
A perfect vaccine pustule.	591·40	424·10	531·10	352·92	549·67	378·58
A modified vaccine pustule.	247·31	437·26	291·87	344·82	278·15	378·16
A failure in -	161·29	138·64	177·03	302·26	172·18	243·26
Total - -	1000·00	1000·00	1000·00	1000·00	1000·00	1000·00

Compared with the corresponding Table in the report for 1878, the total results from vaccination from fresh lymph, or from arm to arm, as in the headings of the present table, show an increase in the proportions of perfect and modified vesicles, and a decrease of failures. In the results of vaccination from preserved lymph the proportionate variations are less striking. An increase is apparent in modified vesicles, and a decrease in perfect and in failures.

The proportionate results of primary vaccination, by which is understood the first vaccination of individuals on whom that operation has never previously been performed, and of re-vaccination, according as the lymph may be from the arm of a recently vaccinated child, or preserved in tubes, show on the side of arm to arm primary and re-vaccination, a considerable preponderance of perfect vesicles, a smaller proportion of modified vesicles on primary vaccination, and a larger on re-vaccination, and a lower rate of failures, the latter particularly among the subjects of re-vaccination, under each heading.

On the Recruiting of the Army.

The number of recruits inspected during the year, as shown by the Annual Returns, was 42,668; of these 36,297 were examined by Army Medical Officers, and 6,371 by Civil Medical Practitioners. At their primary inspection 12,848 or 353·96 per 1,000 were rejected by Army Medical Officers, and 1,288 or 202·16 per 1,000 by Civil Medical Practitioners; on secondary inspection 1,341 more were found unfit, making the total number of rejections 15,477 or 362·73 per 1,000 of the number examined; the ratio of rejections being higher than in 1878 by 64·31 per 1,000.

The following Table shows the numbers inspected and rejected, and the ratios of rejections per 1,000 examined:—

Examined by	Number of Recruits Primarily Inspected.	Number Rejected			Ratio of Rejections per 1,000 Inspected.	
		On Primary Inspection.	On Secondary Inspection.	Total.	On Primary Inspection.	Both Primary and Secondary Inspection.
Army Medical Officers -	36,297	12,848	1,341	15,477	353·96	362·73
Civil Medical Practitioners -	6,371	1,288			202·16	
Total - -	42,668	14,136	1,341	15,477	331·30	362·73

The proportions of rejections by Army Medical Officers and by Civil Medical Practitioners exceed those of the preceding year by 55·73 and 52·82 respectively.

*United
Kingdom.*

The native countries of recruits, the ratios of rejections, and the proportion per 1,000 furnished by each country, are given in the following Table:—

Native Countries of Recruits.	Examined by Army Medical Officers.		Examined by Civil Medical Practitioners.		Rejected on Secondary Inspection.	Total.		Proportion Rejected per 1,000 Inspected.	Proportion per 1,000 Recruits furnished by each Country.
	Inspected.	Rejected.	Inspected.	Rejected.		Primarily Inspected.	Rejected at Primary and Secondary Inspections.		
England and Wales	24,296	8,563	4,766	969	1,002	29,061	10,534	362.5	681.1
Scotland -	3,667	1,328	483	139	129	4,150	1,596	384.6	97.3
Ireland -	7,877	2,820	1,060	167	200	8,957	3,187	355.8	209.9
British Colonies and Foreign Countries	458	137	30	5	10	488	152	311.5	11.4
Not stated -	—	—	12	8	—	12	8	666.6	.3
Total	36,297	12,848	6,371	1,288	1,341	42,668	15,477	362.7	1000.0

As compared with the results of the previous year the millesimal ratio of rejections is higher for England and Wales by 62.9; for Scotland by 59.5; for Ireland by 70.4, and for British Colonies and Foreign Countries by 92.7.

The proportion of recruits from England and Wales, Ireland, and Foreign Countries is rather higher than, and from Scotland is identical with, that of the previous year.

The following Table shows the number of recruits inspected for each arm of the service, the number rejected, the ratios of rejections, and the proportion per 1,000 inspected for each arm:—

Arms of the Service.	Examined by Army Medical Officers.		Examined by Civil Medical Practitioners.		Total Primary Inspections.		Rejected at Secondary Inspections.	Total Rejected at Primary and Secondary Inspections.	Ratio of Rejections per 1,000 of Recruits Inspected.	Proportion per 1,000 inspected for each Arm of the Service.
	Inspected.	Rejected.	Inspected.	Rejected.	Inspected.	Rejected.				
Household Cavalry -	304	106	—	—	304	106	2	108	355.3	7
Cavalry of the Line -	4,406	1,517	146	18	4,552	1,535	20	1,555	341.6	107
Royal Artillery -	3,928	1,445	503	89	4,429	1,534	75	1,609	363.3	104
Royal Engineers -	507	142	4	—	511	142	2	144	281.8	12
Foot Guards -	559	206	97	15	656	221	263	484	737.8	15
Infantry Regiments.	25,624	9,056	5,619	1,166	31,243	10,222	971	11,193	358.2	732
Departmental Corps	971	376	2	—	973	376	8	384	394.6	23
Total -	36,297	12,848	6,371	1,288	42,668	14,136	1,341	15,477	362.7	1,000

The proportion of rejections is higher for all arms than that of the previous *United* year. The increase of the rate of rejections in the Foot Guards is 323, and *Kingdom*. in the Departmental Corps 141 per 1,000 of the numbers inspected.

The occupations of recruits before enlistment, the proportions rejected, and furnished by each group, are shown in the following Table:—

Occupations of Recruits.	Number In-spected.	Number Rejected at Primary In-spection.	Number Rejected at Secondary In-spection.	Total Rejected.	Ratio per 1,000 Rejected.	Proportion per 1,000 furnished by each Group of Occupations.
1. Labourers, Servants, Husbandmen, &c.	25,354	8,312	882	9,174	361·8	504.
2. Manufacturing Artisans (as Clothworkers, Weavers, Lace Makers, &c.).	4,300	1,449	148	1,597	371·4	101
3. Mechanics employed in Occupations favourable to physical development (as Smiths, Carpenters, Masons, &c.).	8,303	2,779	242	3,021	363·8	195
4. Shopmen and Clerks - -	3,469	1,320	64	1,384	398·9	81
5. Professional Occupations, Students, &c.	896	118	9	127	320·7	9
6. Boys under 17 years of age -	836	152	16	168	200·9	20
Not stated - - - -	10	6	—	6	600·0	—
Total - - - -	42,668	14,136	1,341	15,477	362·7	1,000

The proportion of rejections for each group is higher than that of the previous year, except for No. 5 (professional occupations, &c.), in which it is lower. The highest rate of rejections occurred in No. 4 group (shopmen and clerks), and the lowest in No. 6 group (boys). The proportions per 1,000 furnished by groups Nos. 1, 4, and 5 are lower, and by Nos. 2, 3 and 6 higher than in 1878.

The state of education of recruits primarily inspected by Army Medical Officers is shown in the following Table. There is no information available on this head respecting those examined by Civil Medical Practitioners:—

	Numbers Inspected.	Ratio per 1,000.
Unable to read - - - -	5,066	139·6
Able to read only - - - -	3,592	98·9
Able to read and write - - - -	27,639	761·5
Total - - - -	36,297	1,000·0

The state of education as shown by this Table is more favourable than that of the previous year, an increase being apparent in the proportion of men "able to read and write," and a decrease in the respective proportions of those "able to read only," and "unable to read."

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Table showing the number of recruits rejected in 1879, with the causes of rejection arranged in classes, and the ratio per 1,000 in each class :—

Numbers inspected	Recruits Rejected on Primary Inspection.						In- Rejections on Secondary Inspection.	Total Rejections on Primary and Secondary Inspections.	
	Examined by Army Medical Officers.		Examined by Civil Medical Practitioners.		Total.				
	30,297		6,371		42,668			42,668	
Causes of Rejections, in Classes.	Numbers Rejected.	Ratio per 1,000 Rejected.	Numbers Rejected.	Ratio per 1,000 Rejected.	Numbers Rejected.	Ratio per 1,000 Rejected.	Rejections on Secondary Inspection.	Numbers Rejected.	Ratio per 1,000 Rejected.
1. Syphilis - - -	488	12.34	68	10.67	516	12.09	57	573	13.43
2. Scrofula - - -	185	5.10	24	3.77	209	4.90	19	228	5.34
3. Phthisis - - -	118	3.25	21	3.30	139	3.26	18	157	3.68
4. Impaired Constitution	422	11.63	20	3.14	442	10.36	54	496	11.63
5. Muscular Tenuity and Debility.	4,186	115.33	268	42.07	4,454	104.39	329	4,783	112.10
6. Other General Diseases	235	6.48	1	.16	236	5.53	41	277	6.40
7. Diseases of Nervous System.	39	1.07	4	.63	43	1.01	5	48	1.12
8. Weakness of Intellect -	46	1.27	6	.94	52	1.22	13	65	1.52
9. Defective Vision - - -	1,755	48.38	107	50.92	1,063	45.77	162	2,115	49.57
10. Diseases of Eyes and Eyelids.	66	1.82	4	.63	70	1.64	9	79	1.85
11. Diseases of Nose and Mouth.	28	.77	2	.31	30	.70	1	31	.73
12. Diseases of Ears - - -	8	.22	1	.16	9	.21	1	10	.23
13. Deafness - - - - -	61	1.68	3	.47	64	1.50	8	72	1.69
14. Impediment of Speech -	44	1.21	4	.63	48	1.12	7	55	1.29
15. Disease of Heart - - -	749	20.64	72	11.30	821	19.24	134	955	22.38
16. Disease of Arteries (Aneurism).	10	.27	—	—	10	.23	2	12	.28
17. Diseases of Veins (Va- rix).	657	18.10	110	17.27	767	17.98	53	820	19.22
18. Diseases of Lungs (ex- cept Phthisis).	96	2.64	14	2.20	110	2.58	7	117	2.74
19. Loss or Decay of many Teeth.	346	9.52	23	3.61	369	8.05	38	407	9.54
20. Hernia - - - - -	350	9.64	68	10.67	418	9.80	26	444	10.41
21. Laxity of Abdominal Rings.	163	4.49	6	.94	169	3.96	16	185	4.34
22. Hæmorrhoids - - -	125	3.44	9	1.41	134	3.14	13	147	3.44
23. Diseases of Urinary Organs.	29	.80	12	1.88	41	.96	1	42	.98
24. Varicocele - - - -	460	12.92	104	16.32	573	13.43	57	630	14.77
25. Other Diseases of Geni- tal Organs (not Sy- philitic).	62	1.71	4	.63	66	1.55	4	70	1.64
26. Defects of Upper Ex- tremities, from Frac- ture, Contraction, Luxation, &c.	275	7.58	30	4.71	305	7.15	30	335	7.85
27. Defects of Lower Ex- tremities, from Frac- ture, Contraction, Luxation, &c.	425	11.71	45	7.06	470	11.02	72	542	12.70
28. Flat Feet - - - - -	280	7.96	33	5.18	322	7.55	47	369	8.65
29. Diseases of Joints - -	109	3.00	5	.78	114	2.67	5	119	2.79
30. Other Affections of Bones and Muscles.	164	4.52	10	1.57	174	4.08	11	186	4.34
31. Ulcers, Wounds, and Cicatrices.	232	6.39	9	1.41	241	5.65	21	262	6.14
32. Other Affections of the Cutaneous System.	177	4.88	20	4.55	206	4.83	16	222	5.20
33. Malformation of Ears -	4	.11	—	—	4	.09	1	5	.12
34. Malformation of Nose and Mouth.	11	.30	—	—	11	.26	—	11	.26
35. Malformation of Chest and Spine.	384	10.58	82	12.87	466	10.92	55	521	12.21
36. Malformation of Urini- ary or Genital Organs.	15	.41	—	—	15	.35	—	15	.35
37. Marks of Punishment, or letter D. or B.C.	10	.27	—	—	10	.23	1	11	.26
38. Marks of Cupping, Blis- tering, &c.	50	1.38	—	—	50	1.17	7	57	1.33
39. Not recorded - - -	5	.14	—	—	5	.11	—	5	.12
Total Rejected - - -	12,848	353.96	1,288	202.16	14,136	351.30	1,311	15,477	362.73

The principal causes of rejection, arranged in their order of frequency, were muscular tenuity and debility, defective vision, diseases of the heart, varix, varicocele, syphilis, defects of the lower extremities, malformation of chest and spine, impaired constitution, and hernia. As compared with last year, a considerable increase is apparent under rejections for muscular tenuity and debility, the result probably of the rejection by Medical Officers of men under height, in accordance with a General Order published early in 1879, transferring the duty of height measurement from the Military to the Medical Recruiting Officer. In other respects the proportions rejected under each class differ only slightly from those given in the returns of last year.

United Kingdom.

Ages, Heights, and Weights of Recruits.

Table showing the ages of all recruits, as given at their primary inspection, and the proportion per 10,000 at each age:—

Ages.	Numbers Inspected.			Proportion in 10,000.		
	By Army Medical Officers.	By Civil Medical Practitioners.	Total.	Inspected by Army Medical Officers.	Inspected by Civil Medical Practitioners.	Total.
Boys under 17 years	834	47	881	230	74	206
From 17 to 18	980	14	994	270	21	233
" 18 to 19 "	7,871	1,379	9,250	2,169	2,165	2,168
" 19 to 20 "	7,432	1,272	8,704	2,048	1,997	2,040
" 20 to 21 "	4,923	955	5,878	1,356	1,499	1,378
" 21 to 22 "	3,874	735	4,609	1,067	1,154	1,080
" 22 to 23 "	3,388	627	4,015	933.	984	941
" 23 to 24 "	2,874	534	3,408	792	838	799
" 24 to 25 "	3,202	705	3,907	882	1,107	916
25 years and upwards	918	93	1,011	253	146	237
Not stated -	1	10	11	—	15	2
Total	36,297	6,371	42,668	10,000	10,000	10,000

The proportion of boys under 17 years, of recruits from 19 to 20, 20 to 21, 23 to 24, and 24 to 25, is higher than for last year, but lower at all other ages in the Table.

Omitting "boys under 17," also the 11 recruits whose ages are not stated, the total number of recruits whose ages are given is 41,776, with a total number of years of age of 848,880 giving as the average age of recruits for the year 20·32 years.

Table showing the heights of all recruits, taken at their primary inspection, and the proportion per 10,000 at each height:—

Heights.	Numbers Inspected.			Proportion per 10,000.		
	By Army Medical Officers.	By Civil Medical Practitioners.	Total.	Inspected by Army Medical Officers.	Inspected by Civil Medical Practitioners.	Total.
ft. in. ft. in.						
Under 5 3 -	721	41	762	199	64	179
5 3 to 5 4 -	217	7	224	60	11	53
5 4 to 5 5 -	2,658	87	2,745	732	136	643
5 5 to 5 6 -	7,959	1,223	9,192	2,196	1,920	2,154
5 6 to 5 7 -	9,737	1,954	11,691	2,683	3,067	2,740
5 7 to 5 8 -	6,415	1,418	7,833	1,767	2,226	1,836
5 8 to 5 9 -	4,295	788	5,083	1,183	1,237	1,191
5 9 to 5 10 -	2,339	470	2,809	644	738	658
5 10 to 5 11 -	1,050	196	1,246	289	308	292
5 11 to 6 0 -	536	90	626	148	141	147
6 0 and upwards	360	48	408	99	75	96
Not stated -	—	49	49	—	77	11
Total	36,297	6,371	42,668	10,000	10,000	10,000

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Compared with the returns for last year, a considerable decrease—375 per 1,000—is observed in the proportion of recruits from 5 ft. 5 in. to 5 ft. 6 in., and to less degrees in the proportions of those from 5 ft. 4 in. to 5 ft. 5 in., and from 5 ft. 3 in. to 5 ft. 4 in. A large increase—438 per 1,000—is observed in the proportion of recruits from 5 ft. 6 in. to 5 ft. 7 in. and an increase to less degrees among recruits at all the greater heights.

Table showing the weights of recruits inspected by Army Medical Officers, and the proportion per 10,000 at each weight. There is no information of this kind available respecting those primarily inspected by Civil Medical Practitioners, or by Army Medical Officers at many of the smaller stations.

Weights.	Numbers Weighed.	Proportion per 10,000.
Under 100 lbs. - - - -	382	187
100 lbs. to 110 lbs. - - - -	193	94
110 „ to 120 „ - - - -	1,386	680
120 „ to 130 „ - - - -	5,662	2,776
130 „ to 140 „ - - - -	6,088	2,985
140 „ to 150 „ - - - -	3,877	1,901
150 „ to 160 „ - - - -	1,770	868
160 „ to 170 „ - - - -	742	364
170 „ and upwards - - - -	296	145
Total - - - -	20,396	10,000

As compared with the returns for last year, a decrease of 429 per 10,000 is observed in the proportion of recruits from 110 lbs. to 120 lbs., and a slight decrease in the proportion of those of lighter weights. Of recruits from 130 lbs. to 140 lbs., an increase of 216 per 10,000, and of those from 120 lbs. to 130 lbs. of 140 per 10,000. A fairly appreciable increase has also occurred in the proportion of recruits weighing more than 140 lbs.

In the following Tables are arranged, in series according to age, the several weights of 20,396 recruits on primary inspection by Army Medical Officers, and the heights of 42,618 recruits on primary inspection by Army Medical Officers and Civil Medical Practitioners massed together.

The proportions per 10,000 of each weight and height at each age are also given.

The highest proportion per 10,000 at any age and weight is 4,308 among recruits at the age between 18 and 19 years, and at the weight between 120 and 130 lbs.

The highest proportion per 10,000 at any age and height is 3,285, among recruits at the age between 18 and 19 years, and at the height between 5 feet 6 inches, and 5 feet 7 inches.

Weights of Recruits on Primary Inspection by Army Medical Officers.	Boys under 17 Years.	Between 17 and 18.	Between 18 and 19.	Between 19 and 20.	Between 20 and 21.	Between 21 and 22.	Between 22 and 23.	Between 23 and 24.	Between 24 and 25.	25 Years and upwards.	Totals at each Weight.
Under 100 lbs. -	378	4	—	—	—	—	—	—	—	—	382
100—110 lbs. -	76	21	26	38	10	6	2	3	8	3	193
110—120 „ -	26	104	417	459	144	69	53	29	62	23	1,386
120—130 „ -	16	163	1,863	1,464	767	445	344	239	277	94	5,662
130—140 „ -	8	70	1,335	1,448	885	677	508	450	500	117	6,088
140—150 „ -	1	28	470	737	602	529	514	411	475	110	3,877
150—160 „ -	—	13	151	309	270	252	236	220	250	60	1,770
160—170 „ -	—	5	43	107	101	138	90	106	112	40	742
Upwards of 170 lbs.	—	1	20	37	41	53	40	36	50	18	296
Totals at each age	505	399	4,325	4,599	2,820	2,169	1,877	1,494	1,743	465	20,396

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Weights of Recruits on Primary Inspection by Army Medical Officers.	Proportions per 10,000 at each Age.										Total Proportion per 10,000 at each Weight.
	Boys under 17 Years.	Between 17 and 18.	Between 18 and 19.	Between 19 and 20.	Between 20 and 21.	Between 21 and 22.	Between 22 and 23.	Between 23 and 24.	Between 24 and 25.	25 Years and upwards.	
Under 100 lbs.	7,485	100	—	—	—	—	—	—	—	—	187
100—110 lbs.	1,505	526	60	82	35	27	10	20	45	64	9
110—120 "	515	2,607	964	998	511	318	282	194	356	465	680
120—130 "	317	3,835	4,308	3,183	2,720	2,051	1,833	1,600	1,589	2,022	2,776
130—140 "	158	1,754	3,087	3,149	3,138	3,122	3,186	3,012	2,869	2,516	2,985
140—150 "	20	702	1,087	1,603	2,135	2,439	2,739	2,751	2,725	2,366	1,901
150—160 "	—	326	340	672	958	1,162	1,257	1,473	1,486	1,290	888
160—170 "	—	125	99	233	358	636	480	709	643	860	364
Upwards of 170 lbs.	—	25	46	80	145	245	213	241	287	387	145
Total	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000
Heights of Recruits on Primary Inspection by Army Medical Officers and Civil Medical Practitioners.	Boys under 17 Years.	Between 17 and 18.	Between 18 and 19.	Between 19 and 20.	Between 20 and 21.	Between 21 and 22.	Between 22 and 23.	Between 23 and 24.	Between 24 and 25.	25 Years and upwards.	Totals at each Height.
ft. in. ft. in.											
Under 5 3	669	4	2	6	2	4	1	1	2	—	762
5 3 to 5 4	40	1	—	—	—	—	—	—	—	—	224
5 4 to 5 5	54	33	51	31	16	12	8	5	5	2	2,745
5 5 to 5 6	5	—	2	—	—	—	—	—	—	—	9,191
5 6 to 5 7	43	227	538	676	388	226	196	172	127	65	11,081
5 7 to 5 8	1	—	34	20	12	4	8	3	4	1	7,833
5 8 to 5 9	15	319	2,105	2,092	1,075	720	548	469	472	153	5,083
5 9 to 5 10	—	6	349	272	178	121	94	84	93	23	2,809
5 10 to 5 11	16	203	2,556	2,011	1,188	999	922	705	941	196	1,246
5 11 to 6 0	1	2	480	424	299	205	181	146	194	22	626
6 0 and upwards	4	116	1,385	1,241	919	718	647	570	610	193	408
Totals at each age and height	881	994	9,242	8,702	5,873	4,604	4,004	3,405	3,002	1,011	42,618
Of recruits inspected by—											
Army Medical Officers, age not stated.	—	—	—	—	—	—	—	—	—	—	1
Civil Medical Practitioners, height not stated.	—	—	—	—	—	—	—	—	—	—	39
Height and age not stated.	—	—	—	—	—	—	—	—	—	—	10
Total	—	—	—	—	—	—	—	—	—	—	42,668

*United
Kingdom.*

Heights of Recruits on Primary Inspection by Army Medical Officers and Civil Medical Practitioners.			Proportions per 10,000 at each Age.										Total Proportion per 10,000 at each Height.
			Boys under 17 Years.	Between 17 and 18.	Between 18 and 19.	Between 19 and 20.	Between 20 and 21.	Between 21 and 22.	Between 22 and 23.	Between 23 and 24.	Between 24 and 25.	25 Years and upwards.	
ft. in.	ft.	in.											
Under 5	3	-	8,388	50	2	7	3	9	2	3	5	—	179
5	3 to 5	4	670	332	57	36	27	26	20	15	13	19	52
5	4 to 5	5	500	2,284	019	800	681	500	509	514	336	633	644
5	5 to 5	6	170	3,270	2,656	2,717	2,134	1,833	1,608	1,024	1,448	1,741	2,157
5	6 to 5	7	193	2,063	3,285	2,798	2,532	2,615	2,755	2,493	2,909	2,176	2,743
5	7 to 5	8	45	1,187	1,811	1,767	1,912	1,955	1,981	2,026	2,001	2,097	1,833
5	8 to 5	9	34	443	923	1,018	1,332	1,442	1,399	1,551	1,530	1,642	1,183
5	9 to 5	10	—	241	410	532	710	617	959	952	892	930	659
5	10 to 5	11	—	30	123	182	371	478	390	476	476	287	292
5	11 to 6	0	—	50	72	96	172	193	212	197	259	277	147
6	0 and upwards		—	50	42	47	126	132	170	149	131	178	96
Total			10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000

On the Influence of Age on the Mortality of the Troops serving in the United Kingdom.

The rates of mortality at different ages (arranged in quinquennial periods), in the several arms of the service, are shown in the following Table:—

Arms of the Service.		Annual Ratio of Deaths per 1,000 Living, at the following Ages:—					
		Under 20.	20 and under 25.	25 and under 30.	30 and under 35.	35 and under 40.	40 and up- wards.
Household Cavalry	-	—	—	3·21	—	7·35	—
Cavalry	-	2·92	4·42	5·03	7·04	7·85	28·00
Royal Artillery	-	1·42	4·85	6·24	11·44	16·52	21·91
Royal Engineers	-	3·94	6·77	9·32	6·97	12·77	8·77
Foot Guards	-	6·85	6·57	4·58	3·45	2·31	33·06
Infantry (including Depôts)	-	4·61	3·90	6·63	12·25	17·61	18·16
Brigade Depôts	-	·57	7·26	13·77	16·61	22·89	33·84
Garrison, Staff, and Depart- mental Corps.	-	2·35	10·20	8·23	17·99	16·44	15·87
Average of all Troops at Home		3·60	4·94	6·87	11·20	17·50	23·73
Ditto ditto 1868-77		3·04	5·12	6·29	11·93	17·23	23·97
*Civil Male { England and Wales		6·89	8·67	9·55	10·37	11·96	13·96
Population { Healthy Districts -		5·83	7·30	7·93	8·36	8·96	9·86

* The ratio of mortality of males in the civil population under 20 has been calculated for the ages of 17-20, and that of 40 and upwards for the ages 40-45. The data for England and Wales have been obtained from Dr. Farr's English Life Table, published by authority of the Registrar General in 1864, and for Healthy Districts, from Dr. Farr's Healthy District Life Table, published in the 33rd Annual Report of the Registrar General.

III.—ON THE HEALTH OF THE TROOPS SERVING IN THE MEDITERRANEAN.

Sickness and Mortality.

I.—GIBRALTAR.

STATISTICAL REPORT.

In an average annual strength of 4,516 non-commissioned officers and men, *Gibraltar*, there were 4,002 admissions into hospital, 45 deaths (including 8 of invalids who died after arrival in England), and the average number constantly sick was 225·20; the rate of admissions is therefore 886·2, that of deaths 9·96, and that of constantly sick 49·86 per 1,000 of the strength. The admission rate is 214·8, that of deaths 3·37, and that of constantly sick 12·64 per 1,000 of the strength higher than in the preceding year.

The following changes occurred in the garrison. The departure of the 1st Battalion of the 4th Foot on the 6th of January, the arrival of the 93rd Highlanders on the 16th of January, the departure of the 102nd Regiment on the 18th of January, the arrival of the 79th Highlanders on the 11th of June, and the departure of the 42nd Highlanders on the 14th of June.

The corps which served at Gibraltar in the year, and some of the most important of the health statistics are shown in Abstract No. XXXVII. From this Table it will be observed that the 42nd Highlanders and 71st Highland Light Infantry show most unfavourable results as regards the number of admissions, and that the mortality in the 42nd has been very large, which was due to their having come into the Command from Cyprus towards the end of the previous year saturated with malaria.

The Principal Medical Officer writes:—"The past season has been a healthy one, but the statistics of the station have been altogether disarranged by the amount of sickness imported by the 42nd Highlanders and 71st Light Infantry from Cyprus. The 42nd Highlanders were so saturated with malaria that their removal to England became a necessity, and they left Gibraltar for England on the 14th June 1879. The 71st Highland Light Infantry have apparently shaken off the effects of their residence in Cyprus, and have had but few men in hospital lately."

The amount of sickness in the other corps in the Command does not vary much from the usual averages, except that the death rate, 31·87, is high for the Army Service Corps, which consisted, however, of an average strength of only 62·5.

The classes and orders of diseases by which the sickness and mortality of the Command were caused are shown in Abstract No. II.

GENERAL DISEASES.—The admission rate for this class is no less than 203·6 per 1,000 men higher than that for 1878; the increase occurs entirely in the *febrile group*, for which the rate is 205·2 higher, while that for the *constitutional group* is 1·6 lower. The death rate is higher by 2·78 per 1,000 of the strength; in the febrile group there is an increase of 2·72, and in the constitutional of ·06.

Eruptive Fevers.—Of the five admissions, one was for small-pox of a modified form, occurring in a man who bore marks of vaccination, the other four were cases of measles. There was no mortality.

Continued Fevers.—The admission rate is 1·0 per 1,000 men lower than that for last year, and the death rate is ·18 lower. There were five cases of enteric fever, of which two died, 260 of simple continued fever, and two deaths, and 167 cases of febricula. The cases of enteric fever occurred in the months of April, June, August, October, and November; the admissions were from the Royal Artillery, 93rd Highlanders, and the Rifle Brigade.

Paroxysmal Fevers.—The rate of admissions is no less than 206·2 per 1,000 men higher, and that of deaths is 3·11 higher than for last year. Of the

Gibraltar.

1,320 admissions, 1,259 were cases of ague, and 61 of remittent fever. This very high rate of admissions is due to the 42nd Highlanders and the 71st Highland Light Infantry, the former returns 713 cases of ague with 4 deaths, and the latter 541 cases of ague with 1 death, and 7 cases of remittent fever and 3 deaths are besides credited to the 42nd, and 6 to the 71st with 2 deaths, or out of the 1,320 admissions and 12 deaths in the whole Command from these fevers, 1,267 of the admissions and 10 of the deaths occurred amongst these corps. The medical officer in charge of the station hospital writes:—
 “The 42nd Highlanders were rendered quite ineffective by this disease, and the cases increasing from month to month, the regiment was recommended for change to England. The regiment left the Command on the 14th June for the Isle of Wight. The 71st Highland Light Infantry appear to be growing out of the disease, only one case in each month of November and December occurring.”

The Principal Medical Officer also writes:—“The principal complications connected with Cyprus fever were severe congestions of internal organs of the brain, lungs, liver, and especially the spleen, which in all fatal cases was found to be much enlarged. Occasionally dysenteric evacuations, and in many instances scorbutic affections; there was nothing observed resembling enteric fever.”

Rheumatism.—The number of admissions was 250, which gives a lower rate by 4·8 per 1,000 men than that for the preceding year.

Syphilis.—The rate of admissions is 4·7 per 1,000 men higher than last year. This slight increase is attributed to the arrival of a regiment from England. There were 142 admissions for the primary form of the disease, and 35 for the secondary. •

Tubercular Diseases.—The total number returned under this heading was 29. The rate of admissions is 2·7 per 1,000 men lower than in 1878, and the death rate is 16 lower. Four of the deaths occurred in the Command, and two amongst invalids sent home. 20 of the cases are returned as phthisis pulmonalis, six as hæmoptysis, and three as scrofula. All the deaths (6) were from phthisis.

LOCAL DISEASES.—Diseases of the Nervous System.—20 cases of disease are shown under this heading, which is in the ratio of 4·4 per 1,000 of the strength, or 2·2 lower than last year, while the death rate is 23 higher. Neuralgia and epilepsy were the chief causes of admission. The deaths, two in number, were caused by abscess of the brain and meningitis.

Diseases of the Eye.—54 cases are returned under this heading. The rate of admissions, 11·9 per 1,000 men, is almost identical with that of last year.

Diseases of the Circulatory System.—The total number returned is 36, and the admission rate is fractionally higher, and the death rate fractionally lower than in the preceding year. 12 of the admissions were due to pericarditis, 9 to valvular disease of the heart, 5 to hypertrophy of the heart, 3 to palpitation, 1 to aneurism of the aorta, 2 to angina pectoris, and 4 to varicose veins. Two of the deaths were from pericarditis, 1 from calcareous degeneration of the aorta, and 1 from hypertrophy of the heart.

Diseases of the Respiratory System.—The total number of admissions for diseases of the respiratory system was 175, which is in the ratio of 38·8 per 1,000 of the strength, or lower by 9·3 than that for last year, while the death rate is 1·77, or 1·56 higher. The principal diseases causing the admissions were bronchitis (120), pneumonia (28), pleurisy (21). The deaths were due to pneumonia (5), pleurisy (1), bronchitis (1).

Diseases of the Digestive System.—The total number of admissions for diseases of this group was 305, which gives a ratio of 67·5 per 1,000 of the strength, which is almost identical with that of last year. There was no death in the year under report, and only one in the previous year. 92 of the admissions were due to tonsillitis, 77 to dyspepsia, 32 to diarrhoea, 16 to hepatitis, 36 to splenitis, &c.

Diseases of the Urinary System.—Diseases of the urinary system gave 217 admissions, and the ratio per 1,000 of strength is 1·4 lower than last year. Gonorrhœa furnished 165 of the cases, stricture of urethra 15, and epididymitis 13. There was one death from Bright's disease, occurring in an invalid at Netley.

Diseases of the Generative System.—There were 46 admissions for diseases of this system, and the rate per 1,000 is 1·1 lower than that for the previous year; 43 of the cases are returned as orchitis, 2 as hydrocele, and 1 as varicocele.

Diseases of the Cellular Tissue.—The number returned under this heading amounts to 107, and the rate of admissions is 3·3 per 1,000 men higher than that for the preceding year. There were 66 cases of inflammation of the cellular tissue, 41 of abscess.

Diseases of the Cutaneous System gave 150 admissions, the ratio per 1,000 is fractionally lower than in the preceding year. The bulk of the admissions were for boils, ulcers, and eczema.

CONDITIONS.—Debility.—There were 73 admissions, the rate per 1,000 is 1·1 higher than in 1878.

Poisons.—The total number shown under this heading is 65, and the rate of admissions is 4·3 per 1,000 men lower than for the preceding year. Three of the admissions were for *delirium tremens*, and the remaining 62 are returned as cases of alcoholic poisoning.

INJURIES.—The total number returned for injuries is 328, and the rate of admissions is 3·7 per 1,000 of the strength higher than last year.

General.—Two deaths *accidental* are shown under this heading, one was the result of a multiple injury of the head and spine, with fracture of the latter, which occurred when diving while bathing at the North Front, the other was caused by asphyxia by drowning.

Local.—There were two cases of *self-inflicted* gun shot wounds of the head, one of which was fatal.

There were but two *surgical operations*, which were of minor importance, one amputation of the toe, the other the removal of a sebaceous cyst.

Officers.

In an average annual strength of 165 officers, there were 113 attacks of illness, 2 deaths, and 9 were invalided home, being in the ratios respectively of 68·4, 12·12, and 54·54 per 1,000 of the strength. Fevers, diarrhoea, and tonsillitis were the principal causes of the admissions. The deaths were caused by gout and erysipelas.

Women.

In an average annual strength of 340 women, the wives of non-commissioned officers and soldiers, there were 186 attacks of illness and 4 deaths, being in the rates of 54·7, and of 11·76 per 1,000 of the strength respectively. 52 of the illnesses were from diseases of the *febrile group*, including 2 cases of small-pox, and 1 of enteric fever, 19 were cases of rheumatism, 14 of dyspepsia, 12 of bronchitis, 8 of abscess of the cellular tissue, 9 of general debility, &c. The deaths were from remittent fever, puerperal fever, phthisis, and puerperal convulsions.

Children.

In an average annual strength of 730 children of non-commissioned officers and men, there were 315 attacks of illness and 33 deaths, being in the rates of 43·1 and of 42·20 per 1,000 of the strength respectively, which, when compared with the preceding year, gives a higher rate of prevalence of sickness by 66, and a lower rate of mortality by 11·33 per 1,000. The bulk of the admissions were due to continued and paroxysmal fevers (57), diarrhoea (54), bronchitis (44), whooping cough (41), measles (10), chicken-pox (5), scarlet fever (2), &c. The deaths were due to simple continued fever (1), remittent fever (3), whooping cough (1), scrofula (1), anæmia (1), hydrocephalus (2), convulsions (8), pericarditis (1), croup (1), bronchitis (1), congestions of lungs (1), diarrhoea (4), ulceration of the intestines (1), dentition (4), inflammation of the cellular tissue (1), and to general debility (2).

Invaliding.

Three hundred and thirty-five non-commissioned officers and men were sent home from the Command as invalids during the year, being in the ratio of
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Gibraltar.

74·16 per 1,000 of the strength, which is 23·54 higher than the rate for the preceding year, and 102 men were finally discharged the service. The principal disabilities which caused invaliding were fevers (164), chest affections (44), rheumatism (38), general debility (26), diseases of the heart (12), eye affections (12), diseases of the spleen (7), diseases of the liver (5). The Principal Medical Officer writes:—"The number of invalids was largely affected by the 42nd Highlanders, and in a less degree by the 71st Highlanders."

Mean Daily Sick.

The average number constantly sick in a strength of 4,516 was 225·20 or in a ratio of 49·86 per 1,000. The average sick time to each soldier was 18·20 days, and the average duration of each case of sickness was 20·54 days. Compared with the preceding year the rate of constantly sick is 12·64 higher, the average sick time to each soldier is 4·62 days more, and the average duration of each case is ·31 days more.

II.—MALTA.

STATISTICAL REPORT.

Malta.

In an average annual strength of 4,668 non-commissioned officers and men, exclusive of the Royal Malta Fencible Artillery, there were 4,073 admissions into hospital, 39 deaths (inclusive of three invalids who died during their passage to, or after their arrival in England), and the average daily sick in hospital was 216·98. The admission rate, therefore, is 872·5, that for the deaths, 8·35, and for the constantly sick, 46·48 per 1,000 of the strength. Compared with the preceding year the admission rate is 20·4, the death rate is 3·91, and that for the constantly sick 3·19 per 1,000 of the strength lower.

The garrison of Malta during the year was composed of Royal Artillery, three companies of Royal Engineers, the 1st Battalion of the 1st Regiment, the 2nd Battalion of the 10th Regiment, one wing of the 1st Battalion of the 20th Regiment, the 27th, 35th, 61st, and 98th Regiments, the General Staff detachments of the Army Service and Army Hospital Corps, and a few other departmental and attached men. The changes in the Command during the year were as follows:—The arrivals were the 35th Regiment from the West Indies, and a wing of the 1st Battalion, 20th Regiment, from Cyprus. The departures were the 27th Regiment for Hong Kong. Some of the most important of the health statistics of those corps are shown in Abstract No. XXXVII. By this table it will be observed that the highest rate of admissions, 1,084 per 1,000, is given by the 1st Battalion of the 1st Regiment, which also gave nearly the highest last year, and the highest rate of mortality is given by the 35th and 2nd Battalion of the 10th Regiments, except that for the detachment of the Army Hospital Corps, which, however, consisted of an average strength of only 52 men. The sickness in these corps was chiefly due to continued fevers and diseases of the digestive system. Six of the deaths in the 2nd Battalion of the 10th Regiment were due to enteric fever; the comparative high rate of mortality in the 35th Regiment, 14·72 per 1,000, was due chiefly to the fact that four men lost their lives through drowning.

The sickness and deaths in each class and order of diseases are shown in Abstract No. III.

GENERAL DISEASES.—The total number returned for diseases of this class is 1,444, of which 1,029 are shown in the *febrile*, and 415 in the constitutional group, giving ratios respectively of 220·4 and of 88·9 per 1,000 of the strength, which when compared with the preceding year gives an increase in each group, that for the febrile being 31·4, and that for the constitutional 6· per 1,000.

Eruptive Fevers.—Five admissions are shown under this heading, being in the ratio of 1·1 per 1,000 of the strength. Four were cases of measles and one of scarlet fever.

Continued Fevers.—The total number returned for fevers of this kind is 978, the ratio of admissions being 209·5, which is 20·3 per 1,000 of the strength higher than that for last year. There were 12 deaths, giving a ratio of 2·57 per 1,000, which is lower by more than half than the rate for last year. Of

the cases 887 are shown as febricula, 41 as simple continued fever, and 50 as enteric fever. The deaths were all from the latter disease, which gives an admission rate of 10·71 and a death rate of 2·57 per 1,000 of the strength, which are respectively 4·45 and 2·59 lower than the rates for last year, and this decrease in the prevalence of the disease is attributed to the fact that no fresh, immature, unseasoned troops were sent out from England during the year, and to an unusually short hot season. *Simple Continued Fever*.—The rate of admissions is 8·78 per 1,000 men, which is 16·86 per 1,000 lower than that for last year. *Febricula* gives a higher rate of admissions than in the previous year, but the cases are described as having been very mild and ephemeral, occurring in the hottest months, from April to October.

Paroxysmal Fevers.—There were but 11 admissions for fevers of this form, 10 of which were from ague and one for remittent fever.

Rheumatism.—The total number of cases returned for this disease is 173, which is in the ratio of 37·1 per 1,000 of the strength, or 11·4 lower than that for last year. One death occurred in the Command, and one among the invalids, the former was complicated with cardiac disease.

Syphilis.—There were 175 admissions for the primary, and 28 for the secondary form of the disease; the ratio per 1,000 of the strength for both combined is 43·5, which is more than double that for last year. The Principal Medical Officer attributes the increase to the arrival of the fleet, from Besika Bay with large arrears of pay.

Tubercular Diseases.—Of these affections 22 cases are returned which gives a ratio of 3·7 per 1,000 of the strength, or a lower rate by nearly two thirds than that for the preceding year. 11 of the admissions were for phthisis pulmonalis, 10 for tubercular hæmoptysis, and 1 for acute miliary tuberculosis. There were 6 deaths, 5 occurring in the Command, and 1 among the invalids sent home, which gives a ratio of 1·29 per 1,000, which is lower by ·81 than that for last year. The mortality was due to phthisis pulmonalis (5) and acute miliary tuberculosis (1).

LOCAL DISEASES.—Diseases of the Nervous System.—There were 64 admissions giving a ratio of 13·7 per 1,000 of the strength, which is 6·1 higher than that for last year; 16 cases of vertigo are returned, probably due to repeated re-admission of the same individual or individuals, 14 of neuralgia, 6 of epilepsy, 5 of various forms of insanity, 5 of sciatica, 4 of pleurodynia, &c. There was one death which was caused by tetanus, the symptoms of which manifested themselves after bathing. The man appears to have received an injury of his right side some three weeks before by coming in collision with the key of a door, which from that time caused him more or less pain in the seat of injury, but it is not stated whether there was any wound or abrasion.

Diseases of the Eye.—The rate of admissions is lower by one third than in the preceding year. Of 94 admissions 66 were for conjunctivitis.

Diseases of the Circulatory System.—There were 70 admissions for diseases of this group, giving a ratio of 15 per 1,000 of the strength, which is 1·4 lower than that for last year. There were 5 deaths, 4 occurring in the command and 1 among the invalids sent home, the ratio being 1·07 per 1,000 which is fractionally higher than that for the preceding year. No less than 52 of the admissions were for palpitation. Three of the deaths were due to valvular disease of the heart, 1 to fibrous tumour of the heart, and 1 to aneurism of the aorta.

Diseases of the Respiratory System.—188 admissions are shown for diseases of the respiratory organs, and the rate of prevalence is 40·3 per 1,000 against 41·4 in the preceding year. 155 of the admissions were for bronchitis and bronchial catarrh, 15 for pneumonia, 13 for pleurisy, &c. There were 5 deaths, 1 respectively from bronchitis, pneumonia, pleurisy, abscess of the lung, and pulmonary extravasation. The rate of mortality is fractionally higher than for last year.

Diseases of the Digestive System.—775 cases of disease are returned in this group, the rate of prevalence being 166 per 1,000 men, which is 10·1 higher than the rate for last year. There were but 2 deaths, giving a ratio of ·43 per 1,000, which is lower by two thirds than the rate for last year. Of the admissions, 264 were for dyspepsia, 142 for diarrhœa, 96 for tonsillitis, 19 for

Malta.

dysentery, 68 for *tænia solium*, 33 for jaundice, 18 for hepatitis, 20 for colic, 25 for gum boils, &c. The 2 deaths were caused by abscess of the liver.

Diseases of the Urinary System.—There were 240 admissions for these diseases, giving a ratio of 51·5 per 1,000 of the strength, which is fractionally lower than the rate for last year. 180 were cases of gonorrhœa, 13 of gleet, and 14 of stricture of the urethra. There was no mortality in the year under report. In the previous year there were four deaths.

Diseases of the Generative System caused 55 admissions, or a rate of 11·8 per 1,000, which is lower by 4 than that for last year. The causes of admission were, orchitis, 51; hydrocele, 3; varicocele, 1.

Diseases of the Organs of Locomotion.—There were 31 admissions for affections of this group. The rate of admission is 6·7 per 1,000, which is nearly the same as that for last year. 16 cases are returned as acute synovitis.

Diseases of the Cellular Tissue.—The total number returned for affections of the cellular tissue amounted to 125, the rate per 1,000 being 3·7 lower than in the preceding year. 87 of the admissions were for abscess, and 38 for inflammation of the cellular tissue. No death occurred.

Diseases of the Cutaneous System.—There were 289 admissions, the ratio per 1,000 is 61·9, which is 7·8 lower than that for 1878. Ulcers contributed 109 of the cases, Boils 43, Eczema 43, &c.

CONDITIONS, &c.—Debility.—98 admissions are shown under this heading, giving a ratio of 21 per 1,000 of the strength, which is 33·7 lower than the rate for the preceding year. The cause of this reduction is not stated, but it is probably due to the greater immunity of the garrison from febrile diseases, and the enfeebling effects resulting from them.

POISONS.—There were only 8 admissions under this heading, all for delirium tremens. No death occurred.

INJURIES.—There were 526 admissions under this heading, 9 of which are shown as *general* and 517 as *local*. The ratio per 1,000 is 3·7 lower than that for last year. There were 6 deaths, 1 of which is returned as multiple injury, 1 as fracture of the skull, and 4 as asphyxia by drowning, 3 of which lost their lives by the upsetting of a boat in St. Julian's Bay, and the other was drowned while bathing at Pembroke Camp. 184 of the admissions were for sprains, 132 for contusions, 133 for wounds of various sorts, 57 for blisters of the feet, &c. There were two cases of self-inflicted, one cut throat and cut hand. There were no surgical operations.

Officers.

In an average annual strength of 203 officers there were 129 attacks of illness, 2 deaths, and 18 were invalided to England during the year. The ratios given by these numbers are, for attacks of illness 635·46, for mortality 9·85, and for invaliding 88·66 per 1,000 of the strength. Diseases of the febrile group caused 85 of the illnesses, and diseases of the digestive system 34. The 2 deaths were from enteric fever.

Women.

In an average annual strength of 358 women, the wives of non-commissioned officers and men, there were 280 attacks of illness and one death, being in the ratio of 782, and of 2·79 per 1,000 of the strength respectively. Diseases of the febrile group caused 74 of the illnesses, diseases of the digestive system 69, bronchitis 27, debility 20, &c. The death was from dysentery.

Children.

In an average annual strength of 597 children of non-commissioned officers and men there were 493 attacks of illness, and 30 deaths, being in the ratios of 825 and of 50·25 per 1,000 of the strength respectively. Bronchitis, diarrhœa, general debility, and measles caused the bulk of the admissions, the latter disease furnishing no less than 87 cases. The deaths were caused by measles (4), simple continued fever (1), diphtheria (1), tabes mesenterica (1), phthisis (2), convulsions (2), hydrocephalus (2), epistaxis (1), bronchial catarrh (3), dyspepsia (1), diarrhœa (5), enteritis (1), colic (1), dentition (1); general debility (3), multiple injury (1).

Invaliding.

One hundred and fifty-five non-commissioned officers and men were sent home from the Command during the year as invalids, being in the rate of 33·20 per 1,000 of the strength, which is 15·50 lower than the rate for the preceding year. Of these 2 were invalided for diseases of the febrile group, 25 under diseases of the constitutional group, viz., 12 for rheumatism, 3 for secondary syphilis, 7 for tubercular, and 3 for other diseases of this group; 19 were invalided for diseases of the nervous system, 10 for affections of the eye, 6 for affections of the ear, 21 for diseases of the circulatory system, 12 for diseases of the respiratory system, 9 for diseases of the digestive system, 2 for diseases of the urinary system, 7 for diseases of the cutaneous system, 4 for diseases of the organs of locomotion, and 3 for injuries. 67 men were finally discharged the service during the year.

Mean Daily Sick.

The average number of non-commissioned officers and men constantly sick was 216·98, being in the ratio of 46·48 per 1,000 of the strength. The average sick time to each soldier was 16·97 days, and the average duration of each case of sickness was 19·44 days. Compared with the preceding year the rate of constantly sick is 3·19 per 1,000 lower. The average sick time to each soldier is 1·18 days shorter and the average duration of each case of sickness is ·87 days shorter.

ROYAL MALTA FENCIBLE ARTILLERY.

In an average annual strength of 347 non-commissioned officers and men there were 206 admissions into hospital, 2 deaths, and 7·46 men were constantly sick. The admission rate is 593·5, that for the deaths 5·76, and that for the constantly sick 21·50 per 1,000 of the strength. The admission rate is lower by 116·6, that for the deaths by 2·94, and that for the constantly sick by 8·91 than for last year.

The admissions and deaths in the different classes and orders of diseases are shown in Abstract No. IIIA.

GENERAL DISEASES.—The total number returned for diseases of this class is 57, of which 32 appear in the *febrile* group, and 25 in the *constitutional* group. The *febrile* group gives a ratio of 92·2 per 1,000, which is 13·9 higher than that for last year. The *constitutional* group gives a ratio of 72·0 per 1,000, which is 23·6 per 1,000 lower than last year. In the former sub-division *febrile* contributes 31 out of 32 admissions, and 1 case of enteric fever is shown. In the latter sub-division 6 cases are returned as rheumatism, 4 as primary syphilis, 8 as secondary syphilis, 4 as phthisis pulmonalis, 2 as tubercular hæmoptysis, and 1 as anæmia. There was 1 death from phthisis.

LOCAL DISEASES.—*Diseases of the Nervous System.*—The only admission was one for imbecility.

Diseases of the Eye gave 10 admissions, the ratio per 1,000 of strength is lower by more than one half than the last year.

Diseases of the Circulatory System gave only 1 admission and 1 death which was caused by valvular disease of the heart.

Diseases of the Respiratory System caused 17 admissions. These affections show a lower rate by nearly half than last year. 15 were cases of bronchitis and 2 of pneumonia.

Diseases of the Digestive System.—20 admissions are shown for these diseases giving a ratio of 57·6 per 1,000, which is 20·7 lower than that for last year.

Diseases of the Urinary System.—10 cases of gonorrhœa are the only admissions returned under this heading. These diseases were less prevalent than last year by more than half.

Diseases of the Cutaneous System gave 29 admissions, these affections show an increase of 19·7 in the rate of prevalence when compared with last year. 13 of the admissions were for boils.

CONDITIONS.—*Debility* caused 9 admissions.

Malta.

INJURIES.—45 admissions are shown for *Local INJURIES*. The ratio per 1,000 of strength is 16·7 higher than last year. The cases are reported as having been of a trivial nature, occurring chiefly to men on fatigue or gun drill, and 14 were blisters of the feet among recruits who were unaccustomed to wear boots before enlistment.

III.—CYPRUS.

STATISTICAL REPORT.

Cyprus.

In an average annual strength of 660 non-commissioned officers and men, there were 970 admissions into hospital and 14 deaths (inclusive of 4 invalids who died subsequent to their arrival in England or on their way home), and the number constantly sick was 35·70. The rates per 1,000 of the strength are for the admissions 1,469·7, for the deaths 21·20, and for the constantly sick 54·09. Compared with the preceding year, when the occupation extended over only six months, the admission rate is lower by no less than 2927·4 per 1,000 men, and the death rate by 19·07.

The troops stationed in the Command during the year were the 31st Company of the Royal Engineers, the 1st Battalion of the 20th, and detachments of the Army Service Corps, and the Army Hospital Corps. At the end of the month of April the left wing of the 20th Regiment left the Island for Malta, which reduced the strength of the force by about 300 men.

Some of the most important statistics of the health of the Corps which served in the Command are shown in Abstract No. XXXVII. The Senior Medical Officer writes:—"The degree of health enjoyed by the 1/20th Regiment contrasts very favourably with that of the 31st Company of the Royal Engineers. Indeed, the health of the latter was very unsatisfactory, and a reference to the Table will show that the admission, invaliding, and death rates per 1,000 of the strength of the Royal Engineers are respectively about twice, thrice, and twenty-five times greater than the corresponding rates of the 1/20th Regiment. The marked unhealthiness of the 31st Company of the R.E. was no doubt in a large measure due to the following causes: Length of residence. The Company had been in the Island since the occupation, and while stationed at the Monastery Camp, near Nikosia, had suffered severely from the epidemic fever of 1878, by which the men were much weakened in health and rendered liable to recurrences of this form of disease. 2. Throughout the year they have in consequence of the urgency of public works been much more exposed to the influences of disease than the other troops, and on one occasion, to be noted hereafter, suffered most severely and fatally from such exposure."

The classes and orders of diseases by which the sickness and mortality in the Command were caused are shown in Abstract No. IV.

General Diseases.—The admissions for this class show an extraordinary reduction when compared with last year. The rate per 1,000 being in the year under report only 684·9 against 3789·7 in the former year. This decrease occurs entirely in the *Febrile* group, which gives a lower rate by 3134·8, while the *Constitutional* group shows an increase of 30 per 1,000 men.

The mortality rate also shows a great diminution, being lower by 14·00 in the *Febrile* group, while there was no death in the *Constitutional* group.

Eruptive Fevers.—There was no admission under this heading.

Continued Fevers.—The total number returned for fevers of this kind was 38, and the rate of admission is 188·5 per 1,000 of the strength lower than last year. 19 of the cases came under the heading of *febricula* and 19 of simple continued fever. There was no death, although some of the cases appear to have been very serious. The Senior Medical Officer writes:—"The majority of the cases were probably due to exposure to the sun while road-making, and the variations of temperature on Mount Troodos; and intemperance would probably account for the remainder." No case was returned as enteric fever. On which subject the Senior Medical Officer writes:—"No cases are returned as enteric fever, but this disease prevailed among the civil population of both Larnaca and Limassol, and at the former

" station I myself treated 3 typical cases of this affection. Moreover, I am inclined to think that some of the cases returned as simple continued fever at Troodos and Polymedia might have been mild forms of enteric fever, and more especially since more than one medical officer informed me of the difficulty they had experienced in diagnosing accurately not only cases of simple continued fever, but also cases of supposed malarial origin which often presented many of the characteristics of enteric fever."

Cyprus.

Paroxysmal Fevers.—344 cases of disease are returned under this heading, of which 296 are shown as ague, and 48 as remittent fever, giving a ratio of 521·2 per 1,000 of the strength for the admissions, or a reduction of no less than 2944·1 on the rate for last year, while the death rate is 10·61 or 10·64 lower. The Senior Medical Officer writes:—"On comparing the relative numbers of admissions for ague and remittent fever during the past year with those of the preceding year, we find that whereas in 1878 there were about three times as many admissions for the latter disease as there were for ague, in 1879 the number of admissions under ague is six times greater than that for remittent fever." All of the deaths were from remittent fevers, four occurring in the Command, and three among invalids. "These fevers were most prevalent during the months of March, July, and October, but there was no month throughout the year in which cases did not occur, and cases of ague were admitted in every one of the many stations occupied by the troops during the year. The type of both ague and remittent fever was much milder, and the disease much more amenable to treatment than the same class of diseases in 1878. The ague though sharp in the onset was of short duration, easily treated, and had little tendency to recur. The remittent fever commenced like an ordinary attack of ague, lasted from 40 to 60 hours, and in some instances was continuous for much longer periods, several days. The hæmorrhages from the bowels, lungs, and stomach which accompanied the severer forms of this disease in 1878 were only observed in one or two instances, and the tendency to recur at intervals of 7, 14, and 21 days noticed as a characteristic feature of the epidemic in 1878 by several medical officers, and much dwelt upon by Sir A. Home in his special report of that epidemic, was not observed this year. The recovery from remittent fever, except in some of the severer attacks, was rapid, and the disease was not followed by the Anæmia and Cachexia which were common sequels of the same disease in 1878." It is also remarked that three of the four fatal cases returned as remittent fever showed a great similarity both in symptoms and post mortem appearances to the enteric form of disease, the so-called characteristic intestinal lesions of the latter affection being present in each.

Rheumatism.—There were 25 admissions, giving a ratio of 37·9 per 1,000 of the strength, which is higher by 4·3 than that for the preceding year.

Syphilis.—There were 24 admissions for the primary and 17 for the secondary form of the disease, or ratios respectively of 36·4 and 25·8 per 1,000 of the strength; this comparatively low rate is no doubt due to the fact that during the greater part of the year the majority of the troops were quartered at a very considerable distance from the large towns where the disease is said to be rife and prostitution uncontrolled by a Contagious Diseases Act.

Tubercular Diseases.—There were only two admissions under this heading; one for phthisis pulmonalis and one for tubercular hæmoptysis.

LOCAL DISEASES.—*Diseases of the Nervous System.*—There were only 13 admissions, of which 8 were for neuralgia. There was no death.

Diseases of the Eye.—There were 42 admissions, or a ratio of 63·6 per 1,000 of the strength. Most of the cases were conjunctivitis or simple ophthalmia, and were attributed to the glare from the limestone and white marl soils. Several of the cases occurred among men employed road making at Silico.

Diseases of the Circulatory System.—There were but 6 admissions; 1 for hypertrophy of the heart, 2 for palpitation, and 3 for varicose veins.

Diseases of the Respiratory System gave only 26 admissions, or a ratio of 39·4 per 1,000 of strength. They were mild forms of bronchitis or bronchial catarrh.

Diseases of the Digestive System.—There were 181 admissions for diseases of this group, giving a ratio of 274·2 per 1,000 of the strength, which is 21·4

Cyprus.

nigher than that for the preceding year, and there were 4 deaths, or a ratio of 6·06 per 1,000, which is 1·77 lower than last year. The Senior Medical Officer writes:—"Of the 181 admissions for diseases of the digestive system, there were 46 cases of dysentery, 35 of diarrhœa, 38 of dyspepsia, 25 cases of tonsillitis, &c. The dysentery and diarrhœa occurred chiefly at Troodos during the summer and autumn, but there were also a few admissions for both of these affections at Platioris and Polymedia. The medical officer in charge at Mount Troodos attributes the dysentery to climatic causes, but specially to want of farinaceous food. He says, moreover, that the diarrhœa yielded readily to quinine, which would seem to indicate a malarial origin. Surgeon-Major Randall thinks the dysentery of Polymedia due to the cold and damp weather while under canvas, and that some of the attacks were owing to sudden chills which the men exposed themselves to at night from a habit of running to the rear from their beds improperly clothed. Surgeons McSweeney and Keays attribute a good deal of the diarrhœa and dyspepsia to the drinking of native wine, and I quite agree with them. I also think the unlimited quantity of fruit which the men can procure at very cheap rates may account for some of the cases of summer diarrhœa. There were 4 deaths among the admissions under this class of disease, 3 of which were from dysentery, and one from hepatitis. Of the 3 fatal cases from dysentery, there was enlargement and congestion of the liver in 2, and the characteristic ulceration in all. Of the 2 cases of hepatitis, one died and one was invalidated."

Diseases of the Urinary System.—There were 39 admissions for gonorrhœa. No information is given as to where it was contracted.

CONDITIONS.—*Debility.*—There were but 12 admissions under this heading; the rate of admissions is 61·2 lower than in the preceding year.

POISONS.—There were 9 admissions, 4 of which were for delirium tremens, and 5 for alcoholic poisoning.

INJURIES.—*General.*—There is one death shown under this heading; it occurred in a man who went to bed drunk with a bottle of rum, and was found the next morning dead with the trachea occluded with portions of vomited matter. *Local.*—There were 91 admissions, principally for sprains and contusions of a trivial nature, occurring among men employed on the roads. There was one death caused by a fall from horseback fracturing the skull at its base. There were no surgical operations.

Officers.

In an average annual strength of 47 officers, 52 attacks of illness are returned, being in the ratio of 1106·38 per 1,000 of the strength, which is 997·82 per 1,000 lower than the rate for the preceding year. There was no death. Six officers were invalidated, being in the rate of 127·65 per 1,000. Nearly half of the admissions were due to malarial fevers.

Women.

In an average annual strength of 35 women—wives of non-commissioned officers and men—there were 40 admissions into hospital, being in the ratio of 1142·85 per 1,000 of the strength. There were no deaths, and the illnesses attributable to climatic causes were inconsiderable in number, and bear a relatively low proportion to the admissions from other causes.

Children.

In an average annual strength of 49 children there were 63 admissions into hospital and 5 deaths. The admission rate is therefore 1285·7, and the death rate 102 per 1,000. None of the deaths were due to climatic affections, but were caused by *tabes mesenterica* (1), *bronchitis* (1), *diarrhœa* (1), *premature birth* (1), *general debility* (1). Twenty of the admissions were caused by *tonsillitis* and *ulcerated throat*, and the Senior Medical Officer writes:—"A slight epidemic of sore throat prevailed among the children at the camp at Mathiati during the very cold weather at the commencement of the year, and was at first suspected to be diphtheria; but only in one case was an adult person attacked, and the disease yielded readily to treatment, and in

“ the opinion of the medical officers in charge was mainly due to the severe *Cyprus*.
“ cold of the season.” There were only 8 admissions for fevers, 4 for febricula,
and 4 for ague.

Invaliding.

Twenty-five non-commissioned officers and men were sent home from the Command during the year as invalids, being in the ratio of 37·86 per 1,000 of the strength, or a decrease of no less than 115·15 on the rate for last year. Malarial fevers necessitated the invaliding in 11 instances, hepatitis in 1, and general debility in 3, the remaining 10 being for disabilities in nowise connected with climatic influences. The number finally discharged the service was 39.

Mean Daily Sick.

The average number of non-commissioned officers and men constantly sick was 35·70, being in the ratio of 54·9 per 1,000 of the strength. The average sick time to each soldier was 19·74 days, and the average duration of each case of sickness was 13·43 days.

IV.—ON THE HEALTH OF THE TROOPS SERVING IN THE DOMINION OF CANADA.

Sickness and Mortality.

STATISTICAL REPORT.

Dominion of Canada.

THE average annual strength of the non-commissioned officers and men was 1,729; the admissions into hospital were 1,701; the deaths, including that of an invalid sent home, were 8; the average number constantly sick was 79·03. The proportions given by these numbers are, for admissions 983·8, for deaths 4·62, and for constantly sick 45·70 per 1,000 of the strength. Compared with the preceding year the rate of admissions is 397·1 per 1,000 higher, the rate of deaths is 1·18 lower, and that of constantly sick is 15·86 higher.

The corps which served in Canada in the year were the 1st, 2nd, and 4th Batteries of the 10th Brigade of the Royal Artillery, the 97th Regiment, the 101st Regiment, Detachments of the Royal Engineers, Army Service Corps, and Army Hospital Corps, the general staff, and a few attached men of other corps. The health statistics of these corps is shown in Abstract No. XXXVII. From this Table it will be observed that the health of the 101st Regiment contrasts unfavourably with that of the other corps, the rate of admissions being as high as 1608·2 per 1,000 of the strength, which was due to the fact of their having come into the Command from Cyprus at the end of the previous year, suffering much from paroxysmal fevers.

The admissions and deaths from the various classes and orders of diseases are shown in Abstract No. V.

GENERAL DISEASES.—739 admissions appear under this heading, of which 455 are shown in the *febrile* and 284 in the *constitutional* group, giving ratios respectively of 263·2, and 164·3 per 1,000 of the strength, which, when compared with the preceding year, gives a higher rate for the febrile group by 186·1 per 1,000 of the strength, and for the constitutional by 77·9. This increase is due to the existence of paroxysmal fevers in the 101st Regiment which arrived in the Command in November of the previous year from Cyprus, saturated with malaria, and to a great prevalence of venereal diseases among the troops generally.

Continued Fevers.—Only six admissions are shown under this heading, one of which is returned as enteric fever and five as simple continued fever. There was no death.

Paroxysmal Fevers.—441 admissions are shown for these fevers, of which 439 are returned as ague, and two as remittent fever. The rate of admissions is 255·1 per 1,000 of the strength, which is no less than 180·9 higher than that for last year, but there was no mortality. The disease was rife in the 101st Regiment on its arrival from Cyprus, but had well nigh disappeared in the month of August, owing to the beneficial effect of the Canadian climate, and at the end of the year the health of the regiment was pronounced satisfactory by the Principal Medical Officer.

Diphtheria.—One case occurred in a man of the Army Hospital Corps who contracted it while in attendance on children suffering from the disease. He recovered.

Rheumatism gave 43 admissions, or a ratio of 24·9 per 1,000 of the strength, which is 17·4 lower than the rate for the preceding year.

Syphilis.—There were 162 admissions for primary and 67 for secondary syphilis during the year, which gave ratios respectively of 93·7 and of 38·7 per 1,000 of the strength. Compared with the preceding year the rate for both affections combined is no less than 98·8 per 1,000 higher. No satisfactory cause is assigned for this sudden rise, which principally occurred in

the latter part of the year, but it is evident that a well enforced Contagious Diseases Act is much needed.

Tubercular Diseases.—There were 10 admissions, of which five were for phthisis pulmonalis, three for tubercular hæmoptysis, and two for scrofula. There were two deaths, both from phthisis pulmonalis. The admission rate is a little lower than in 1878, and the rate of mortality is also so, fractionally.

LOCAL DISEASES.—Diseases of the Nervous System.—12 admissions are shown for these diseases, and no death. Compared with the preceding year the rate of admissions is 3·4 higher. Three of the cases are returned as epilepsy, 2 as neuralgia, 3 as vertigo, 3 for various forms of insanity, and 1 as sciatica.

Diseases of the Eye.—There were 22 admissions for various affections of the eye, 13 of which were for conjunctivitis. The rate of admissions is a little higher than that for last year.

Diseases of the Circulatory System.—The total number returned for diseases of this order is 28, of which 17 are for palpitation. The rate of admissions is 16·2 per 1,000 of the strength or 5·8 higher than that for last year. There was one death, which was from pericarditis supervening on acute rheumatism.

Diseases of the Respiratory System.—There were 97 admissions, giving a ratio of 56·1 per 1,000 of the strength, which is almost identical with the rate for the preceding year. The bulk of the admissions were for bronchial catarrh and bronchitis, and there were 11 cases of pneumonia. There were two deaths, one in the Command, out of hospital, from congestion of the lungs, brought on by exposure, the other in an invalid at Liverpool from bronchitis.

Diseases of the Digestive System.—The total number of admissions was 208, giving a ratio of 120·3 per 1,000 of the strength, which is 50·7 higher than that for last year. Dyspepsia and tonsillitis contributed 145 of the cases. There was no death.

Diseases of the Urinary System.—There were 167 admissions under this heading, of which 119 are shown as gonorrhœa, 16 as sequelæ of gonorrhœa, and 32 as other diseases; the rate of admissions for all diseases of this system together is 96·5 per 1,000 men, which is 31 higher than that for last year, the increase being due to a greater prevalence of gonorrhœa, no cause for which is assigned.

Diseases of the Cutaneous System.—There were 74 admissions. The ratio per 1,000 of strength is 42·8, which is higher by 4 than that for 1878. The cases are reported as being of an unimportant nature, chiefly ulcers and boils.

CONDITIONS.—Debility.—18 cases are returned, the ratio per 1,000 of the strength is more than half less than that for the previous year. The cases were chiefly confined to men of the 101st Regiment, whose health had become impaired from repeated attacks of Cyprus fever.

POISONS.—Two cases of delirium tremens and 25 of alcoholic poisoning, make up the 27 admissions shown under this heading in the Abstract; the rate per 1,000 of strength is 4·6 higher than last year; the facility for obtaining liquor of bad quality is stated to conduce largely to the production of these evils.

INJURIES.—Two deaths are returned for *general injuries* and no admission. One of the deaths was caused by asphyxia by drowning, and in the other case the man was frozen to death while in a state of intoxication. 201 admissions are shown for *local injuries*, being in the ratio of 116·2 per 1,000 of the strength, 72 of these are returned as contusions, 52 as sprains, 44 as wounds, and there were 13 fractures of various kinds. Falling on the ice was responsible for many of these injuries. No death resulted from *local injuries*. There were no surgical operations.

Officers.

In an average annual strength of 84 officers there were 42 attacks of illness, being in the rate of 500 per 1,000 of the strength. There was no death. Three officers were invalided to England.

Women.

In an average annual strength of 140 women, wives of non-commissioned officers and men, there were 31 attacks of illness, being in the rate of 221·42

*Dominion of
Canada.*

per 1,000 of the strength. There was no disease specially prevalent, the highest number of admissions, 5, was for general debility. There was no death.

Children.

In an average annual strength of 293 children of non-commissioned officers and men, there were 195 attacks of illness and 27 deaths, being in the ratio respectively of 665·52 and 92·15 per 1,000 of the strength. The high rate of mortality was due to outbreaks of diphtheria among the children of the Royal Artillery and Royal Engineers. The deaths from this disease alone amounting to 14; of the admissions, no less than 75 were for measles, but there was no mortality from this cause. The total number admitted for diphtheria was 31.

Invaliding.

Fifty-seven non-commissioned officers and men were sent home from the Command as invalids during the year, being in the ratio of 32·95 per 1,000 of the strength, which is 17·30 higher than the rate for last year. Of these, 28 men were invalided to England for diseases of the febrile group, 8 for diseases of the constitutional group, viz., 4 for rheumatism and 4 for tubercular affections. 14 men were invalided for local diseases, and one on account of an injury.

The increase in the number sent home from the Command during the year was caused by the necessity for sending to England for change of climate a number of men of the 101st Regiment on account of ague contracted in Cyprus. 24 invalids were finally discharged the service.

Mean Daily Sick.

The average number constantly sick during the year was 79·03, being in the rate of 45·70 per 1,000 of the strength, or an increase of 15·86 on the previous year. The average sick time to each soldier is 16·68 days, which is 5·79 days longer than last year, and the average duration of each case is 16·96, which is 1·60 days shorter.

V.—ON THE HEALTH OF THE TROOPS SERVING IN BERMUDA.

Sickness and Mortality.

STATISTICAL REPORT.

The average annual strength of the non-commissioned officers and men *Bermuda.* was 1,970; the admissions into hospital were 1,175, the deaths were 10, the average constantly sick was 67·22. The proportions given by these numbers are, for admissions 596·4, for deaths 5·08, and for constantly sick 34·12 per 1,000 of the strength. The admission rate is 60·5 per 1,000 men lower than that for the preceding year, the death rate is ·87 lower, and the constantly sick rate is 1·21 lower.

The corps which served in Bermuda in the year were the same as last year, viz., two Batteries of Garrison Artillery, five Companies of Royal Engineers, the 1st Battalion of the 19th Regiment, the 46th Regiment, Detachments of the Army Service and Army Hospital Corps, and the General Staff. Some of the most important health statistics of these corps are shown in Abstract No. XXXVII. By this table it will be observed that the health of all corps was good, the highest rates of admission and deaths being given by the 1st Battalion of the 19th Regiment, which were only 779·5 and 6·13 per 1,000 of the strength respectively.

The admissions and deaths in the various classes and orders of diseases are shown in Abstract No. VI.

GENERAL DISEASES.—214 admissions are shown for diseases of this class, of which 70 are shown in the *febrile* group, and 144 in the *constitutional*, giving ratios respectively of 35·5 and of 73·1 per 1,000 of the strength. Compared with the preceding year the rate for diseases of the *febrile* group is 3·7 per 1,000 men lower, and that for those of the *constitutional* is 9·1 higher. The death rate for the whole class is ·46 lower, the whole of the decrease being in the *constitutional* group, in which there was no mortality.

Eruptive Fevers.—There was a complete immunity from these affections.

Continued Fevers.—62 cases are returned under this heading, of which 12 are shown as *enteric* fever, and 50 as *febricula*, being in the ratio of 31·5 per 1,000 of the strength for all these affections combined, which is 5·7 lower than the rate for last year. There were two deaths, both of which were caused by enteric fever. The habits of the people and the want of proper sanitary contrivances in respect to the cesspools in the towns of St. George and Hamilton are said to be powerful factors in the production of this form of fever. Exposure to the sun on the public works would seem to be the chief cause of febricula.

Paroxysmal Fevers.—There was no admission for fever of this kind, Bermuda appearing to enjoy a peculiar immunity from sources of miasma.

Cholera.—One admission is shown under this heading with a fatal termination. The symptoms appeared to have many of the characteristics of the Asiatic form of the disease, but it would seem to have been brought on by eating indigestible food.

Rheumatism.—There were 42 admissions, giving a ratio of 21·3 per 1,000 of the strength, which is a little lower than the rate for the preceding year. 17 of the cases are shown as muscular, 13 as chronic, and 11 as acute rheumatism.

Syphilis.—65 admissions are shown for the primary and 21 for the secondary form of the disease, being in the rate of 33·0 per 1,000 for the former and of 10·7 for the latter; the rate for both affections combined is 11·5 higher than

Bermuda.

last year. All the admissions for the primary disease except six were at Hamilton.

Tubercular Diseases.—13 admissions are shown, giving a ratio of 6·6 per 1,000 of the strength, which is lower, fractionally, than that for last year; 11 of the admissions were for phthisis. There was no death.

LOCAL DISEASES.—*Diseases of the Nervous System* furnish 16 admissions, or a ratio of 8·1 per 1,000 of the strength, which is slightly lower than the rate for last year. There was one death, which occurred out of hospital, from apoplexy, in a man of intemperate habits. Nearly half of the admissions were for neuralgia.

Diseases of the Eye gave 27 admissions, or a ratio of 13·7 per 1,000 of the strength, which is 5·1 lower than that for the previous year. 21 of the cases are returned as conjunctivitis.

Diseases of the Circulatory System.—22 cases are returned under this heading, giving a ratio of 11·2 per 1,000, which is 3·7 per 1,000 lower than the ratio for 1878. There was one death out of hospital from valvular disease of the heart. The man's death was induced by syncope after prolonged diving. 17 of the admissions were for palpitation. This affection is ascribed to excess in drinking and to exposure on the works.

Diseases of the Absorbent System.—61 admission are shown for diseases of this system, or a ratio of 31 per 1,000 of the strength, which, when compared with the rate for last year, gives an increase of 24·1. It is suggested that these affections, which in all instances attacked the inguinal glands, were probably due to "strains incurred by men engaged on the public works" or climatic causes, but it is worthy of remark that the number of admissions at Prospect amounted to 48, while the other stations gave only an aggregate of 13; and as 59 out of a total of 65 admissions for primary venereal sores also took place at Prospect, it would not seem unreasonable to conclude that many of these swellings were of a syphilitic nature.

Diseases of the Respiratory System.—The total number returned for these diseases is 74, and the rate per 1,000 of the strength is 37·6, which is 16·3 higher than in the preceding year. 67 of the admissions were for bronchitis and bronchial catarrh. There was no death.

Diseases of the Digestive System.—There were 222 admissions, or a ratio of 112·7 per 1,000 of the strength. Compared with last year, the rate is 71·7 per 1,000 lower. 117 cases of dyspepsia are returned, 41 of diarrhoea, 16 of tonsillitis, 9 of gum-boil, 10 of colic, 7 of hæmorrhoids, 5 of hepatitis, &c. The cases of dyspepsia were attributed, in the majority of instances, to excessive drinking. There was one death, which resulted from hepatitis. The rate of mortality is 51 per 1,000. There was no death in the preceding year.

Diseases of the Urinary System.—49 cases of gonorrhoea, 11 of sequelæ of gonorrhoea, and 20 "other diseases" of this system are returned. The rate of admissions for all combined is 49·6, or 12·3 higher than last year. As in the case of syphilis, the great bulk of the cases occurred at Prospect.

Diseases of the Generative System.—There were 13 admissions for orchitis, 2 for protrusion of the testicle, 1 for hydrocele, and 1 for varicocele. The ratio per 1,000 of the strength is 1·7 higher than last year.

Diseases of the Cutaneous System.—There were 110 admissions, giving a ratio of 55·8 per 1,000 men, which is 3·2 higher than the rate for last year. Ulcers and boils were the principal causes of the admissions.

CONDITIONS, &c.—Debility.—37 cases are returned. The rate of admissions is 18·8 per 1,000, which is lower by more than half than that for last year.

POISONS.—15 admissions came under this heading. The ratio per 1,000 of the strength is fractionally lower than last year. 13 cases of delirium tremens, 1 of alcoholic poisoning, and 1 of lead poisoning are returned. There was one death from alcoholic poisoning in a man of the 46th Regiment. It is remarked by the Principal Medical Officer that intemperance is very noticeable, and that the circumstance may be set down to the cheapness of rum and the facility for purchasing the spirit afforded by the wages earned on the public works.

INJURIES.—General.—Two deaths are shown under the heading of general injuries, caused in both instances by asphyxia by drowning; one the result of

an accident while boating; in the other case the man was "found drowned." *Bermuda.* *Local Injuries* gave 216 admissions and 1 death. 77 of the cases are returned as wounds, 59 as contusions, 43 as sprains, 18 as blisters of the feet, and 15 as fractures. Employment of the men on the public works expose them much to these accidents, but it is sad to relate that at St. George's, where 10 cases of fracture came under treatment, the accident happened in almost every instance when the sufferer was under the influence of drink. In the other instances the ribs, the acromion, the clavicle, the radius, the condyle of the humerus, the ulna, the metacarpis, the patella, the tibia, and the fibula were the seats of fracture. The death was caused by fracture of the pelvis, and occurred at Prospect while the subject of the injury was engaged quarrying, when a huge piece of stone fell on him. There were no surgical operations.

Officers.

In an average annual strength of 91 officers there were 29 attacks of illness, being in the ratio of 318·68 per 1,000 of the strength, which is 197·44 lower than the preceding year. There was no death. Two officers were invalided to England.

Women.

In an average annual strength of 136 women, the wives of non-commissioned officers and men, there were 26 attacks of illness, the rate of admissions being only 191·17 per 1,000, which is 27·93 lower than the rate for last year. There was no death in either year.

Children.

In an average annual strength of 282 children of non-commissioned officers and men, there were 47 attacks of illness and 7 deaths, being in the rates respectively of 166·66 and 24·82 per 1,000 of the strength. The rate of admissions is 25·86 per 1,000 higher than that for the preceding year; the death rate is 9·66 lower. Measles, diarrhoea, and general debility were the principal causes of the admissions. The deaths were caused by diarrhoea (3), dysentery (1), bronchitis (1), convulsions (1), tubercular meningitis (1).

Invaliding. !

Nineteen non-commissioned officers and men were sent home from the Command as invalids during the year, being in the ratio of 9·64 per 1,000 of the strength, which, when compared with the rate for the previous year, is 7·22 lower. Of these, 3 were invalided for diseases of the constitutional group, 1 for disease of the eye, 1 for disease of the ear, 2 for diseases of the circulatory system, 1 for inflammation of glands, 3 for diseases of the respiratory system, 3 for diseases of the digestive system, 1 for stricture of the urethra, 1 for ulcer, 2 for debility, and 1 for an injury. The number finally discharged the service was 42.

Mean Daily Sick.

The average number of men constantly in hospital during the year was 67·22, being in the rate of 34·12 per 1,000 of the strength, which is 1·21 lower than the rate for the preceding year. The average sick time to each soldier was 12·45 days, which is fractionally lower than last year, and the average duration of each case of sickness is 20·88 days, which is 1·25 days longer than in 1878.

VI.—ON THE HEALTH OF THE TROOPS SERVING IN THE WEST INDIES.

Sickness and Mortality.

STATISTICAL REPORT.

I. WHITE TROOPS.

West Indies Command.

In an average annual strength of 1,070 non-commissioned officers and men there were 686 admissions into hospital, 11 deaths (including that of an invalid sent home), and the average number constantly sick was 34·91; the rate of admissions is therefore 641·1, that of deaths 10·27, and that of constantly sick 32·63 per 1,000 of the strength. Compared with 1878 the admission, death, and constantly sick rates are respectively 363·3, 3·13, and 20·95 lower.

The troops in the Command consisted of the 18th Battery 9th Brigade Royal Artillery, the 1st Battalion of the 4th and the 35th Regiments, detachments of the Royal Engineers and Army Hospital Corps, Garrison Staff and Sergeants of West India Regiments. The changes in the Command were as follows: the 35th Regiment left the Command for Malta in January, having been relieved by the 1st Battalion of the 4th Regiment. The stations occupied by the troops were Barbados, Trinidad, and Jamaica. Some of the most important of the health statistics of these corps are shown in Abstract No. XXXVII.

The admissions and deaths in the various classes and orders of diseases are shown in Abstract No. VII.

GENERAL DISEASES.—153 admissions are shown in the *febrile group* and 85 in the *constitutional*, giving ratios respectively of 143·0, and of 79·4 per 1,000 of the strength, which, when compared with the preceding year, gives a lower rate for the former by 126·9, and a higher rate for the latter by 5·2.

The death rate is lower for the *febrile group* by 3·46, and for the *constitutional* by ·86 per 1,000.

Continued Fevers.—98 admissions are shown for simple continued fever, 28 for febricula, and 6 for enteric fever, giving a ratio of 123·4 for all combined, which is 96·4 per 1,000 lower than the rate for last year. The ratio of admissions for enteric fever was 5·6, and that for deaths 1·8 per 1,000, which are respectively higher by 4·6 and ·82 than in the preceding year. All the admissions for this form of fever occurred at Newcastle, Jamaica, the first in May in a private of the 1st Battalion 4th Regiment, who had been living in one of the native villages for a fortnight before his admission, and to the insanitary condition of which the origin of his disease was attributed; the other cases occurred during the month of October, and no cause can be assigned for the origin of the disease, the sanitary condition of the place being in every way satisfactory.

Paroxysmal Fevers.—There were 20 admissions for fevers of this kind, giving a ratio of 18·7 per 1,000 of the strength; 10 of the cases are returned as ague and 10 as remittent fever; the rate of admissions is lower by more than half than in the preceding year. There was one death from remittent fever, which occurred in a prisoner confined in the civil penitentiary; the rate of mortality is almost identical with that of last year.

Rheumatism gave 49 admissions, or a ratio of 45·7 per 1,000, which is nearly double the rate for last year.

Syphilis.—19 cases of primary and 8 of secondary are shown. The rate of admissions for these affections is 25·3, which is lower by 21·2 per 1,000 than that for 1878.

Tubercular Diseases.—There were 8 admissions under this heading, 6 of which were for phthisis pulmonalis and 2 for tubercular hæmoptysis; there was one death from phthisis pulmonalis. The admission rate is higher by 3·0 per 1,000, and the death rate lower by ·86 than in the preceding year.

LOCAL DISEASES.—Diseases of the nervous, circulatory, respiratory, digestive, urinary, generative, and cutaneous systems, and of the eye, the ear, and

cellular tissue, were less prevalent than last year, an increase being observable only in affections of the organs of locomotion, and the absorbent system where it is very slight. Five deaths occurred, viz., one from dementia, and one from apoplexy at Jamaica, and one respectively from empyema and cirrhosis of the liver at Barbados. The other death occurred in an invalid on board ship, and was caused by hepatitis. *West Indies Command.*

CONDITIONS.—Debility.—There were 14 admissions under this heading, the ratio per 1,000 is more than two-thirds less than last year.

POISONS.—There were two admissions, both for delirium tremens.

INJURIES.—102 admissions are shown, all of which are returned as *local injuries*. The ratio per 1,000 of the strength is 35·2 lower than last year; 46 of the cases are shown as wounds, 25 as sprains, 20 as contusions, 6 as blisters of the feet, 4 as fractures, and 1 as burn. There were two deaths, one from fracture of the base of the skull caused by a fall from a car at Jamaica, the other from *self-inflicted* gunshot wound of the head in a private of the 1st Battalion 4th Regiment, who shot himself while on sentry at Barbados. The death rate is 1·87 higher than last year.

Officers.

In an average annual strength of 112 officers there were 81 attacks of illness, 3 deaths, and 4 were invalided home; the rates given by these numbers are for attacks of illness 723, for mortality 26·78, and for invaliding 35·71 per 1,000 of the strength. The chief causes of admissions were febrile affections, diseases of the digestive system, and general debility. The deaths were caused by a *self-inflicted* gunshot wound during the delirium of yellow fever, by simple continued fever with ensuing effusion on the brain, and by Addison's disease in an officer absent from the Command on sick leave in Ireland.

Women.

In an average annual strength of 89 women, the wives of non-commissioned officers and men, there were 38 admissions into hospital, being in the ratio of 426 per 1,000 of the strength. There was no death; 9 of the admissions were caused by paroxysmal fevers and febricula, and 15 are returned as cases of general debility.

Children.

In an average annual strength of 164 children of non-commissioned officers and men 36 attacks of illness are shown, and 6 deaths, being in the ratios respectively of 219 and of 36·58 per 1,000 of the strength. With the exception of 6 cases of whooping cough there was no special prevalence of disease amongst them. The deaths were due to convulsions (2), croup (1), encephalitis (1), and diarrhoea (2).

On the Extent of Invaliding.

22 non-commissioned officers and men of the white troops were sent home as invalids during the year, being in the ratio of 27·10 per 1,000 of the strength, which is 20·84 higher than the rate for the preceding year; of these 4 were sent to England on account of paroxysmal fevers, 1 for secondary syphilis, 3 for phthisis pulmonalis, 5 for various forms of insanity, 3 for epilepsy, 1 respectively for neuralgia, sciatica, impaired vision, cataract, inflammation of the external meatus, deafness, aneurism of the aorta, hepatitis, and psoriasis, and 4 for general debility. The number finally discharged the service in the year was 16.

Mean Daily Sick.

The average number of non-commissioned officers and men constantly sick was 34·91, being in the ratio of 32·63 per 1,000 of the strength. The average sick time to each soldier was 11·91 days, and the average duration of each case of sickness was 18·57 days.

Compared with the preceding year the rate of constantly sick is 20·95 per 1,000 lower. The average sick time to each soldier is 7·65 days shorter, and the average duration of each case of sickness is ·90 days shorter.

II. BLACK TROOPS.

*West Indies
Command.*

The black troops serving in the Command consisted of the head-quarters of the 1st West India Regiment (which left Jamaica on the 22nd of December for the west coast of Africa), a wing of the 2nd West India Regiment, and a detachment of the corps of Military Labourers. The stations occupied were Barbados, Jamaica, Nassau, Honduras, and Demerara.

The average annual strength of the non-commissioned officers and men (exclusive of white sergeants) was 1,138, the admissions into hospital were 1,312, the deaths 20, and the average number constantly sick was 66·56. The proportions given by these numbers are for admissions 1152·8, for deaths 17·57, and for constantly sick 58·49 per 1,000 of the strength.

Compared with the preceding year the admission rate is 26 per 1,000 higher, the death rate 7·7 higher, and the constantly sick rate 4·57 higher.

The admissions and deaths in the various classes and orders of diseases are shown in Abstract No. VIII.

GENERAL DISEASES.—269 admissions are shown in the *febrile* and 285 in the *constitutional* group, giving ratios respectively of 236·4 and of 250·4 per 1,000 of the strength, which, when compared with last year, gives a lower rate for the former by 60·2, and a higher rate for the latter by 30·9. There was no death in the *febrile* group, in the *constitutional* there were four. The death rate for the whole class is 3·64 per 1,000 men lower than last year.

Continued Fevers.—165 admissions are shown under this heading, of which 103 cases are returned as *febricula*, 61 as simple continued fever, and 1 as enteric fever. The rate of admission for all combined is 31·5 per 1,000 lower than last year. There was no death.

Paroxysmal Fevers.—There were 103 admissions; the ratio per 1,000 of the strength is 26·9 lower than last year. There was no death either year.

Rheumatism contributed 67 admissions, giving a ratio of 58·9 per 1,000 of the strength, which is 9·2 lower than the rate for last year.

Syphilis.—157 admissions are shown for *primary* and 42 for *secondary* affections, giving a ratio of 174·8 per 1,000 for both combined, which is 35·9 higher than the rate for last year.

Tubercular Diseases.—Under this heading 12 cases of *phthisis pulmonalis* and 3 of *scrofula* are returned. The rate of admission is 3·4 per 1,000 higher than last year. There were 4 deaths, all from *phthisis pulmonalis*. The rate of mortality is 3·51 per 1,000, which is almost identical with that for 1878.

LOCAL DISEASES.—Compared with the preceding year an increase is observed in the rates of admissions for diseases of the nervous, circulatory, respiratory, urinary, generative, and locomotive systems, and for those of the cellular tissue, while there is a decrease in the rates for diseases of the absorbent, digestive, and cutaneous systems, and in those of the eye, the ear, and the nose. The deaths in this class were 13, and were caused by valvular disease of the heart (2), fatty degeneration of the heart (2), hypertrophy of the heart (1), sacular aneurism (1), pneumonia (1), bronchitis (1), dysentery (2), enteritis (1), cirrhosis of liver (1), Bright's disease (1), in the previous year there were but three deaths in this class, which were caused by Bright's disease, dysentery, and abscess.

CONDITIONS.—*Debility.*—14 admissions are shown under this heading in a ratio of 12·3 per 1,000 of the strength, which is 3·8 per 1,000 lower than that for last year.

INJURIES.—One death is shown under the heading of *general injuries*, and 115 admissions and 2 deaths as *local injuries*. The rate of admissions is 101·1 per 1,000 of the strength, which is 7·3 per 1,000 lower than that for 1878. Of the cases returned 46 are shown as contusions, 44 as wounds, 17 as sprains, 3 as fractures, 1 as gunshot wound, 1 as burn, 2 as blisters of the feet, and 1 as cut throat, *self-inflicted*. The deaths were caused, in one instance, accidentally by asphyxia by drowning, in another by *self-inflicted* cut throat, and in the third case a private of the 1st West India Regiment who had been in prison under the civil power escaped therefrom and was shot in the bush by an Indian in his endeavour to arrest him. The death rate is 1·74 per 1,000 higher than last year.

On the Extent of Invaliding.

31 of the black troops were discharged in the Command during the year.

West Indies]
Command.

Mean Daily Sick.

The average number of non-commissioned officers and men constantly sick was 66·56, being in the ratio of 58·49 per 1,000 of the strength. The average sick time to each soldier was 21·35 days, and the average duration of each case of sickness was 18·52 days. Compared with the preceding year the rate of constantly sick was 4·57 per 1,000 higher. The average sick time to each soldier is 1·67 days longer, and the average duration of each case of sickness is 1·05 days longer.

VH.—ON THE HEALTH OF THE TROOPS SERVING IN THE WEST AFRICA COMMAND.

Sickness and Mortality.

STATISTICAL REPORT.

1. WHITE TROOPS.

West Africa. The average annual strength of the European non-commissioned officers serving in the Command was 12; the admissions into hospital among them were 23; one death occurred from *self-inflicted* cut-throat in the bandmaster of the 2nd West India Regiment, whilst labouring under temporary insanity, and two were invalided home, one from ague, the other for phthisis pulmonalis. 17 of the admissions were for paroxysmal fevers.

2. BLACK TROOPS.

The Black Troops in the Command consisted of the 2nd West India Regiment, and the stations occupied were Sierra Leone and Cape Town.

The average annual strength of the troops was 492 non-commissioned officers and men, amongst whom there were 779 admissions into hospital, 7 deaths, and an average constantly sick of 31·38. The rates given by these numbers are, for admissions, 1583·3, for deaths, 14·22, and for constantly sick 63·78 per 1,000 of the strength. The rate of admissions is 188·5, and that of deaths 3·14 per 1,000 men higher than in the preceding year; the constantly sick rate is lower by 2·57.

For the Sierra Leone station the admission rate is 1687·50, the death rate is 12·50, and the constantly sick rate is 21·88 per 1,000 of the mean strength.

For the Cape Coast station the admission rate is 1389·54, the death rate is 17·44, and the constantly sick rate is 9·50 per 1,000 of the mean strength.

The admissions and deaths in each class and order of diseases are shown in Abstract No. IX.

GENERAL DISEASES.—310 admissions are shown in the *febrile group*, giving a ratio of 630·1 per 1,000 of the strength, which is 218·7 higher than that for last year, and is due to the greater prevalence of paroxysmal fevers. There was no death in this group, either in the year under report or the previous year. For *constitutional diseases* the total number returned is 130, giving a ratio of 264·2 per 1,000 men, which is 40·2 per 1,000 lower than the rate for last year. There were five deaths in this group, giving a rate of 10·16 per 1,000, which is 8·31 higher than that for 1878.

Eruptive Fevers.—Seven admissions are shown under this heading, six of which were for measles and one for small-pox; in the preceding year there was no admission. The rate is 14·2 per 1,000 of the strength. There was no death.

Continued Fevers.—There was but one admission for fevers of this kind, it was for febricula.

Paroxysmal Fevers.—280 admissions are shown for these fevers, 245 of which were for remittent fever, and 35 for ague, giving a ratio of 569·1 per 1,000 of the strength, which when compared with last year's rate gives an increase of 183·5. These fevers were proportionately most prevalent in the Sierra Leone division of the Command.

Rheumatism.—40 admissions are shown for the various forms of this disease, giving a ratio of 81·3 per 1,000 of the strength, which is 29·4 lower than that for last year. 24 cases are shown under the heading of chronic rheumatism: 11 as muscular; three as acute; and two as chronic osteo arthritis.

Syphilis.—37 admissions are shown for primary, and 39 for secondary, affections, giving ratios respectively of 75·2 and of 79·3 per 1,000 of the strength; the rate for both combined being 18·9 lower than that for last year. The disease is always very prevalent amongst the native population, and a Government Ordinance for its suppression is said to be much needed.

Tubercular Diseases.—There were 12 admissions, nine of which were for phthisis pulmonalis, and three for tubercular hæmoptysis. The rate of admission is 9·6 per 1,000 men higher than for last year. There were four deaths, all from phthisis pulmonalis. The death rate is 6·23 higher than in the preceding year.

General Dropsy.—A death occurred under this heading in the civil prison at Freetown, probably dependent on heart disease.

LOCAL DISEASES.—*Diseases of the nervous, absorbent, and digestive systems*, and those of the eye, the organs of locomotion, and cellular tissue show lower rates of admission than last year, while those of the circulatory, respiratory, urinary, and cutaneous systems and of the ear are higher, that for the generative systems being the same in both years. There were but two deaths in the class, both occurring in diseases of the digestive system, and were caused by dysentery and abscess of the liver.

CONDITIONS, &c.—*Debility*.—Only three admissions are shown, giving a ratio of 6·1 per 1,000, which is 12·4 lower than that for last year.

POISONS.—Only one admission is shown, which is returned as a case of alcoholic poisoning. In the preceding year there was no admission.

INJURIES.—*General Injuries*.—One case of multiple injury is returned, the nature of which is not mentioned. 48 cases of *local injury* are returned, being in the ratio of 99·6 per 1,000 men, which is 22·1 higher than last year. 26 of the cases are returned as wounds, nine as contusions, eight as sprains, one as dislocation. All seem to have been the result of accident. There was no death.

Officers.

In an average annual strength of 25 officers there were 76 attacks of illness, being in the ratio of 3040 per 1,000 of the strength, which is 673·34 higher than that for last year. The bulk of the admissions were for paroxysmal fevers; there was no death in the year under report, nor in the preceding year. Five officers were invalided to England, and four went for change to Madeira.

Women.

In an average annual strength of 48 women, wives of the non-commissioned officers and men (of West Indian or African origin), there were 106 attacks of illness and one death, being in the ratios respectively of 2208·23 and of 20·83 per 1,000 of the strength. Paroxysmal fevers and rheumatism were the chief causes of admission. The death was due to peritonitis. There was no death in the preceding year.

Children.

In an average annual strength of 51 children of non-commissioned officers and men there were 79 attacks of illness and one death, being in the ratios respectively of 1549·01 and of 19·60 per 1,000 of the strength; 38 of the admissions were due to paroxysmal fevers. The death was caused by convulsions. In the preceding year there was no death.

Invaliding.

Twenty-one non-commissioned officers and men were finally discharged the service during the year.

Mean Daily Sick.

The average number constantly sick during the year was 31·38, being in the ratio of 63·78 per 1,000 of the strength. The average sick time to each soldier is 23·28 days, and the average duration of each case is 14·70.

VIII.—ON THE HEALTH OF THE TROOPS SERVING AT THE CAPE OF GOOD HOPE AND AT ST. HELENA.

Sickness and Mortality.

STATISTICAL REPORT.

Cape of Good Hope and St. Helena.

The average annual strength of the non-commissioned officers and men was 12,564, of which 178 were stationed at St. Helena. The admissions into hospital in both portions of the Command were 12,263, the deaths were 1,248 (inclusive of 15 invalids who died at Netley or on their passage home), and the average number constantly sick was 696·05. The proportions given by these numbers are for admissions, 97·0; for deaths, 99·33; and for constantly sick, 55·40 per 1,000 of the strength. The admission rate is 49·9, that for the deaths is 79·6, and that for the constantly sick is 7·9 per 1,000 men higher than for the preceding year, these increases being due to the employment of the troops on active service in the field in Zululand and in the Transvaal. The death rate especially being much enhanced by the casualties of war, and particularly so by the disaster at Isandula.

The troops stationed in the St. Helena portion of the Command consisted of a detachment of the 7th Brigade, Royal Artillery, a Company of the Royal Engineers, Detachments of the 2nd battalion of the 4th and 99th Regiments, and the staff and departments.

The corps of which the force in the Cape of Good Hope consisted were the 1st (King's) Dragoon Guards, the 17th Lancers, Royal Artillery, Royal Engineers, 2nd Battalions of the 3rd and 4th, the 1st Battalion of the 13th, the 2nd Battalion of the 21st, the 1st and 2nd Battalions of the 24th, the 57th, 58th, 3rd Battalion of the 60th, the 80th, 88th, 90th, 91st, 94th, and 99th Regiments, detachments of the Army Service, Army Hospital Corps, and staff and departments.

The admissions and deaths in the various classes and orders of diseases are shown in Abstract No. X.

GENERAL DISEASES.—*Febrile Group.*—The total number returned for diseases of this group amounts to 3,555, giving a ratio of 282·9 per 1,000 of the strength, which is 147·0 per 1,000 higher than the rate for last year. The number of deaths was 243, or a ratio of 19·34 per 1,000, which is 12·59 higher than that for last year.

Constitutional Group.—The number of admissions under this heading was 1,254, giving a ratio of 99·8 per 1,000, which is 44·3 lower than that for 1878. The number of deaths was 16, or a ratio of 1·27 per 1,000, which is ·20 higher than the rate for last year.

Eruptive Fevers gave 15 admissions, viz., 2 for measles, 3 for scarlet fever, and 10 for dengue, all occurring at the Cape of Good Hope; there was no death. The rate of admissions is ·8 higher than that for 1878.

Continued Fevers.—2,684 admissions are recorded under this heading, giving a ratio of 213·6 per 1,000 men, which is 108·1 per 1,000 higher than that for last year; 1,591 cases are returned as simple continued fever, 348 as febricula, and 745 as enteric fever, all in South Africa. The deaths amounted to no less than 218, or a ratio of 17·35 per 1,000, which is 11·31 higher than that for last year, they were caused by simple continued fever in 21 instances, and 196 men fell victims to enteric fever. There is much diversity of opinion amongst the medical officers as to the true nature of these fevers, many maintaining that cases returned as enteric were often of a malarial type, and should more properly have been called typho-malarial, while others as stoutly asserted that they were dealing with typical cases of enteric fever; and it is also stated that many of the cases shown as simple continued fever were, in reality, mild forms

of the enteric. Be this as it may, a large proportion of the fatal cases were originally admitted under the headings of simple continued and remittent fevers, the nomenclature of the disease being only changed in many instances to enteric when post mortem examination revealed the lesions of the small intestines said to be peculiar to this form of fever but which would seem to have been met with also in fatal cases of remittent fever. The great prevalence of these fevers is attributed to many causes, to the pollution of the drinking water on the line of march, to the foul condition of camping grounds induced by native troops and followers, to decomposition of animal and vegetable matter, to the overcrowding and unavoidable protracted occupation of certain confined posts, &c. Durban, where enteric fever was rife, was considered a great focus for the transmission of the disease, by means of the various regiments and detachments proceeding thence up country, but it would seem to have had an independent origin in many places due to local causes. Admissions for the disease occurred at nearly every station, and on the line of march. It was most prevalent from April to August, affected chiefly the troops serving in the lower column along the unhealthy coast line of country.

Cape of Good Hope and St. Helena.

Paroxysmal Fevers.—828 admissions are shown under this heading, 567 of which are returned as remittent fever, and 258 as ague, at the Cape of Good Hope, and 3 cases of ague were admitted at St. Helena. The rate of admissions is 65·9 per 1,000 of the strength, which is 41·6 per 1,000 higher than that for last year; there were 24 deaths, or a ratio of 1·91 per 1,000, which is 1·20 higher than that for last year; they were all returned as remittent fevers. The bulk of the cases occurred at Pietermaritzburg, Durban, Helpmakaar, Fort Pearson, and on the march, and most of those attacked were men who had previously suffered from these fevers in the Mauritius, Ceylon, and other malarious stations. The Principal Medical Officer states that remittent fever caused 567 admissions, out of which 24 proved fatal, but no doubt a large number of these cases were enteric fever. Out of the fatal enteric cases it so happened that 12 were in hospital for remittent fever, the true nature of the case only becoming manifest on post mortem examination. Now out of the 24 fatal cases of this disease there were only five post mortem examinations, and in these it was very doubtful whether they should not have been returned as enteric. It is, therefore, highly probable that if a post mortem had been practicable in all, many would have revealed the characteristic lesions of enteric fever.

Other Diseases of the Group.—28 admissions are shown for other diseases of the febrile group, of which 23 were for erysipelas, 2 for influenza, 1 for mumps, and one for diphtheria, which proved fatal, at the Cape of Good Hope, and 1 case of erysipelas was admitted at St. Helena.

Rheumatism.—The total number of admissions was 696, of which 686 took place at the Cape of Good Hope and 10 at St. Helena. 220 cases of acute rheumatism are shown, 140 are returned as muscular, 320 as chronic, 11 as lumbago, 1 as gonorrhoeal rheumatism, 3 as chronic osteo arthritis, and there was 1 case of gout. The rate of admissions for all combined is 55·4 per 1,000 men, which is 4·2 per 1,000 higher than that for last year.

Syphilis.—212 cases of primary and 240 of secondary syphilis are shown; the rate of admissions for both combined is 36·0 per 1,000, which is lower by 48·0 than that for last year. The fact of the proportion for secondary syphilis being higher than that for primary is explained by the troops having been employed on active service in the field where there was little opportunity of contracting the primary disease which was most rife at Durban and Cape Town, which latter place is said to have become a hot bed for venereal disease since the abolition of the Contagious Diseases Act.

Tubercular Diseases.—61 admissions are shown under this heading, giving a ratio of 4·8 per 1,000 of the strength, which is 2·3 lower than that for last year. 51 cases of phthisis pulmonalis are returned, 4 of tubercular hæmoptysis, 1 of acute military tuberculosis, and 5 of scrofula, all at the Cape; there were 14 deaths, 8 of which occurred in the Command, and 6 among invalids sent home, 13 resulted from phthisis pulmonalis, and 1 from acute military tuberculosis. The death rate is 1·11 per 1,000, which is ·04 per 1,000 higher than last year's.

Scurvy and Purpura.—There were 8 admissions for scurvy and 1 for purpura; the rate of admissions is higher by a small fraction than that for last

Cape of Good Hope and St. Helena.

year. The cases of scurvy occurred at Rorke's Drift (3), Utrecht (3), Sander-ton (1), Cape Town (1); the cases were mild and due to lack of fresh vegetables; 7 made a good recovery, and 1 was invalided home. The Principal Medical Officer states, "Although there were only 8 cases of this disease there can be but little doubt that in reality the scorbutic taint affected a great many men, retarding their recovery, and aggravating or even causing much sickness by rendering the men more prone to disease. Fresh vegetables being very scarce their place was supplied by compressed vegetables and the frequent issue of lime juice."

Other Diseases of this Group gave 36 admissions and 2 deaths, all occurring at the Cape of Good Hope; the admissions were caused by anæmia (22), general dropsy (7), fibrous tumour (2), glandular tumour (2), sanguineous cyst (1), cancer (1), diabetes (1). The deaths are returned under the heading of cancer (1), and medullary cancer (1). The rate of admissions is a little higher than for last year.

LOCAL DISEASES.—Diseases of the Nervous System.—166 admissions are shown for diseases of this group, giving a ratio of 13·2 per 1,000 men, which is 4·1 per 1,000 higher than that for 1878; all but 9 occurred at the Cape of Good Hope; 41 of the admissions were due to epilepsy, 35 to neuralgia, 32 to sunstroke, 23 to various forms of insanity, &c. There were 8 deaths, giving a ratio of ·64 per 1,000 men, which is lower by ·07 per 1,000, than last year's; they were caused by meningitis (1), apoplexy (3), sunstroke (3), paralysis (1). There was no death at St. Helena.

Diseases of the Eye caused 156 admissions, or a ratio of 12·4 per 1,000, which is a decrease of 18·7 per 1,000 on the ratio for last year.

Diseases of the Circulatory System.—There were 281 admissions for diseases of this group, giving a ratio of 22·4 per 1,000 men, which is 4·6 per 1,000 higher than that for last year. All but 11 of the cases occurred at the Cape of Good Hope. 183 cases of palpitation are shown, 54 of valvular disease of the heart, 1 of aneurism of the heart, 7 of aneurism of the aorta, 1 of aneurism of the popliteal artery, 1 of traumatic aneurism, 9 of hypertrophy of the heart, 2 of angina pectoris, 1 of pericarditis, 1 of syncope, and 21 of varicose veins. There were 10 deaths in the Command and 1 among the invalids. The death rate is ·88 per 1,000 men, which is lower than that for the preceding year by ·54. They were caused by valvular disease of the heart (4), hypertrophy of the heart (1), fatty degeneration of the heart (1), aneurism of the heart (1), aneurism of the aorta (2), traumatic aneurism (1), pericarditis (1).

Diseases of the Respiratory System.—508 admissions are shown for these diseases, giving a ratio of 40·4 per 1,000 men, which is 3·6 lower than that for last year. All but 19 took place at the Cape of Good Hope. There were 29 deaths in the Command, and 1 of an invalid. The death rate is 2·39 per 1,000, or ·61 per 1,000 higher than last year's. They were caused by pneumonia (15), bronchitis (10), asthma (1), pleurisy (4). Two of these occurred at St. Helena from pneumonia. At the Cape 361 of the admissions were due to bronchitis and bronchial catarrh, and 72 to pneumonia, caused, no doubt, by exposure in the field.

Diseases of the Digestive System.—2,742 admissions are shown under this heading giving the very high ratio of 218·3 per 1,000 of the strength, which is 33·5 per 1,000 in excess of that for the preceding year. Only 32 of the cases were admitted at St. Helena. In South Africa the principal causes of admission were diarrhoea, which contributed 1,087 cases, dysentery, which gave 735, jaundice, which gave 154, hepatitis, for which there were 95 admissions, tonsillitis, for which there were 202, and hernia, which gave the extraordinary high number of 78, and for which no explanation is given. The bulk of the admissions in the group were due to causes incident to troops serving in the field, and the contamination of the drinking water is said to be the most prominent feature in the development of the diseases. There were no less than 90 deaths, of which 62 were caused by dysentery, 6 by diarrhoea, 7 by peritonitis, 5 by abscess of the liver, 1 by chronic ulcer of the stomach, 1 by enteritis, 1 by perforation of the intestines, 1 by obstruction of the intestines, 1 by stricture of the intestines, 1 by intussusception, 2 by ascites, 1 by jaundice, and 1 by typhlitis. The death rate is 7·16 per 1,000 of the strength, which is 4·14 per 1,000 in excess of last year's. There was no death at St. Helena.

Diseases of the Urinary System.—184 admissions for gonorrhœa are shown, 69 for the sequelæ of gonorrhœa, and 52 for other diseases of this group. The ratio of admissions for all combined is 24·3, which is 29·2 lower than that for the preceding year. The fall is no doubt due to the employment of the troops in the field. There were 3 deaths, 2 from nephritis and 1 from Bright's disease.

Diseases of the Generative System gave 126 admissions, or a ratio of 10·0 per 1,000; it is nearly the same as last year's.

Diseases of the Organs of Locomotion.—There were 81 admissions, or a ratio of 6·5 per 1,000, which is slightly lower than that for 1878. There were 2 deaths which were due to caries and acute synovitis.

Diseases of the Cellular Tissue.—265 admissions are shown under this heading, or a ratio of 21·1 per 1,000, which is 10·0 per 1,000 lower than that for the preceding year. Abscesses (212) caused the bulk of the admissions.

Diseases of the Cutaneous System.—The total number of cases shown is 753, giving a ratio of 59·9 per 1,000 men, which is 25·3 per 1,000 lower than last year's.

CONDITION.—Debility.—693 admissions are shown under this heading, or a ratio of 55·2 per 1,000 men, which is 36·6 per 1,000 higher than that for the preceding year. The increase is due chiefly to the effects of fevers, dysentery, and other causes incidental to a campaign. There were 2 deaths.

Poisons.—The number of cases of poisoning returned is 48. The rate of admissions is 3·8 per 1,000, which when compared with last year's shows a reduction of 2·1 per 1,000. 25 cases of delirium tremens are shown, 20 of alcoholic poisoning, 2 of snake bite, and 1 of opium poisoning. There were 13 deaths all due to alcoholic poisoning induced by indulgence in the pernicious liquor of the country. The death rate is 1·03 per 1,000, which is fractionally lower than last year's.

INJURIES.—General Injuries.—Three admissions and 21 deaths are shown under this heading. The admissions were caused by multiple injury (1), lightning stroke (1), asphyxia by drowning (1). The deaths were due to asphyxia by drowning (16), asphyxia by hanging (1), which was *suicidal*, lightning stroke (3), and multiple injury (1).

Local Injuries.—The total number admitted under this heading was 948, or a ratio of 75·5 per 1,000. They were due chiefly to wounds (236), contusions (233), sprains (223), blisters of feet (89), fractures (67), burns and scalds (37). The rate of admission for injuries of this class is lower by nearly half than last year's. There were 2 deaths, 1 from fracture, and 1 from gunshot wound, which was *self-inflicted*. 4 of the injuries were *self-inflicted*.

In Action.—182 admissions are returned, and 807 deaths, the bulk of the latter (610) were the result of the disaster at Isandula.

Surgical Operations.—19 surgical operations were performed during the year, viz., 1 excision of the eyeball for cancer, 1 for strangulated inguinal hernia, 1 for excision of shoulder joint after an accidental gunshot wound, 2 amputations of the leg, and 2 of fingers after accidents, 1 amputation of the shoulder joint, 2 of the arm, 1 of the thigh, and 1 of the leg after gunshot wounds received in action, and 7 for the extraction of bullets.

South Africa.

Officers.

In an average annual strength of 545 officers serving in South Africa there were 556 admissions into hospital and 59 deaths (inclusive of 7 who died when absent from their corps), being in the annual ratio of 1,020, and of 108·25 per 1,000 of the strength respectively. The admissions were due chiefly to fevers, dysentery, and diarrhœa, and the deaths were caused by battle (40), enteric fever (7), simple continued fever (3), dysentery (4), cancer of liver (1), phthisis pulmonatis (1), epilepsy (1), sunstroke (1), drowning (1). 119 were invalided, giving the very high ratio of 218·34 per 1,000. The chief causes of invaliding were fevers (29), general debility (34), wounds received in action (9), rheumatism (9), dysentery (7).

*Cape of Good
Hope and
St. Helena.*

Women.

In an average annual strength of 296 women, wives of non-commissioned officers and men, there were 135 admissions into hospital, being in the annual ratio of 456 per 1,000 of the strength. The admissions were not caused by any special class of disease. There was no death.

Children.

In an average annual strength of 549 children of non-commissioned officers and men there were 347 attacks of illness and 38 deaths, being in the rates of 632 and of 69·21 per 1,000 of the strength respectively. The chief causes of the admissions were bronchitis (61), debility (53), febricula (53), hooping cough (42), diarrhœa (42), dysentery (16), &c. There were 7 cases of measles and 5 of chicken pox. The deaths were due to debility (18), hooping cough (5), dysentery (4), diarrhœa (4), convulsions (4), bronchitis (2), encephalitis (1).

St. Helena.

Officers.

The average annual strength of the officers was 9. There were but 3 attacks of illness, and no death.

Women.

The average annual strength of the wives of the non-commissioned officers and men was 24, there were 19 attacks of illness, which were not due to any special class of disease, and there was one death from phthisis pulmonalis.

Children.

The average annual strength of the children of the non-commissioned officers and men was 39. There were 10 attacks of illness due to no special class of disease, and there was 1 death from tabes mesenterica.

Invaliding.

1,400 non-commissioned officers and men were sent home from the Command during the year as invalids, 1,392 from the Cape, and 8 from St. Helena, being in the ratio of 111·43 per 1,000 of the strength, which is 85·32 higher than the rate for the preceding year. Of these 350 were invalided for diseases of the febrile group, 186 for those of the constitutional group, no less than 144 of which were for rheumatism, 41 for diseases of the nervous system, 21 for those of the eye, 9 for those of the ear, 135 for those of the circulatory system, 37 of which were for valvular diseases of the heart and 70 for palpitation, 3 for those of the absorbent system, 41 for those of the respiratory system, 202 for those of the digestive system (72 of which were for dysentery, 40 for diarrhœa, 28 for hepatitis, 28 for hernia, &c.), 18 for diseases of the urinary system, 12 for those of the generative system, 15 for those of the organs of locomotion, 7 for those of the cellular tissue, 11 for those of the cutaneous system, 256 for debility, 37 for local injuries, not caused by battle, and 56 for injuries received in action. 268 invalids were finally discharged the service in the year, being in the ratio of 21·33 per 1,000.

Mean Daily Sick.

The average number constantly sick of the non-commissioned officers and men was 696·05, being in the ratio of 55·40 per 1,000 of the strength. The average sick time to each soldier was 20·22 days, and the average duration of each case of sickness was 20·72 days. Compared with the preceding year the rate of constantly sick is 7·88 per 1,000 higher; the average sick time to each soldier is 2·87 days longer, and the average duration of each case of sickness is 1·97 days longer.

IX.—ON THE HEALTH OF THE TROOPS SERVING IN THE ISLAND OF MAURITIUS.

Sickness and Mortality.

STATISTICAL REPORT.

In an average annual strength of 348 non-commissioned officers and men, there were 1,059 admissions into hospital, 9 deaths, and the average number constantly sick was 32·42. *Mauritius.*

The proportions given by these numbers are for admissions 3043·1, for deaths 25·85, and for constantly sick 93·16 per 1,000 of the strength. Compared with the preceding year the admission rate, and the rate for the constantly sick, are respectively 473·4 and 11·48 higher, while the death rate is 5·40 per 1,000 lower.

The corps which served at the Mauritius in the year consisted of the 10th Battery 7th Brigade of the Royal Artillery, and detachments of the 88th and 91st Regiments, with a few men of the staff and departments.

The changes in the Command were as follows:—Half a battery of Artillery left the Command for Zululand in March, and returned in October. One company of the 88th Regiment left for Zululand in March, and the whole of the detachment for India in October. The detachment of the 91st Regiment arrived from Zululand in October.

Some of the most important of the health statistics of these corps are shown in Abstract No. XI. From this Table it will be observed that the detachment of the 88th Regiment gives the highest rates of admissions and deaths, viz., 3654·2, and 31·92 per 1,000 respectively, and that the staff and departments, the strength of which was, however, inconsiderable, give the lowest, the rate of admissions being 578·9 per 1,000, while there was no death. Ague caused more than half the admissions in the Command during the year.

The admissions and deaths in the various classes and orders of diseases are shown in Abstract No. XXXVII.

GENERAL DISEASES.—582 admissions are shown in the *febrile* group, and 119 in the *constitutional*, the former giving a ratio of 1672·4 per 1,000 of the strength, and the latter a ratio of 342·0. Compared with last year there is an increase of 256·5 per 1,000 in the rate of admissions for febrile diseases, and of 123·3 in the rate for those of the constitutional group. The death rate is lower in the febrile group by 6·75, and in the constitutional by 9·62 per 1,000 than last year.

Continued Fevers.—40 admissions are shown for these diseases, of which 37 are returned as febricula, 2 as simple continued fever, and 1 as enteric fever. The rate of admission for all combined is 114·9 per 1,000, which is 100·5 higher than that for last year. No reason is given for this increase. There was one death caused by enteric fever in a young soldier of the 91st Regiment, who was admitted into hospital seven days after his arrival from Natal, the disease having been probably contracted on the passage.

Paroxysmal Fevers.—The total number of admissions for these fevers was 542, of which 539 are shown as cases of ague, and 3 as remittent fever, the ratio per 1,000 of the strength being 1557·5, which is 184·9 higher than the rate for last year. Ague was most prevalent during March, April, May, June, and July, which appear to be the most unhealthy months of the year, particularly the three first mentioned, during the heavy rains. There was no death from these fevers. In the previous year two deaths occurred.

Rheumatism contributed 19 admissions, or a rate of 54·6 per 1,000 of the strength, which is 4·1 higher than the rate for last year.

Mauritius.

Syphilis.—54 cases of primary and 42 of secondary syphilis are returned, the rate of admission for both affections combined being 275·9 per 1,000, which is 134·1 higher than that for last year. There is no contagious diseases ordinance in force in the Island.

Tubercular Diseases caused 4 admissions, or a rate of 11·5 per 1,000 of the strength, which is fractionally lower than that for last year. There was no death in the year under report, in the previous year there were three. Two of the admissions were for phthisis pulmonalis, and two for tubercular hæmoptysis.

LOCAL DISEASES.—Diseases of the nervous system only gave one admission, which was for neuralgia.

Diseases of the Eye and Ear gave only 10 admissions, 3 for affections of the former organ, and 7 for the latter.

Diseases of the Circulatory System.—22 cases are returned under this heading, giving a ratio of 63·2 per 1,000 men, which is 36·8 higher than the rate for last year; 9 cases of valvular disease of the heart are shown, 1 of hypertrophy, 8 of palpitation, and 3 of varicose veins. The cases of valvular disease of the heart occurred chiefly among men of the 88th Regiment, and are attributed to the hardships and over exertion undergone by that corps while on active service at the Cape of Good Hope.

Diseases of the Respiratory System.—There were 21 admissions for these diseases, giving a ratio of 60·3 per 1,000 of the strength, which is 33·5 lower than the rate for last year. There was no death. Bronchitis and bronchial catarrh caused 17 of the admissions.

Diseases of the Digestive System.—The total number returned for these diseases is 89, giving a ratio of 255·7 per 1,000 of the strength, which is 94·6 higher than the rate for the preceding year. There were 5 deaths, or a ratio of 14·37 per 1,000, which is 7·16 in excess of that for last year. Dyspepsia occasioned 33 of the admissions, diarrhoea 30, colic 6, dysentery 3, hernia 3, &c. The deaths were due to dysentery 3, abscess of the liver 1, enteritis 1. The large number of admissions for dyspepsia is attributed in a great degree to the intemperance of the men, particularly in the detachments of the 88th and 91st Regiments, which had come into the Command from the Cape of Good Hope well supplied with money.

Diseases of the Urinary System.—There were 22 admissions for gonorrhœa, 5 for sequelæ of gonorrhœa, and 11 for other diseases of this system, giving a ratio of 109·2 for all combined, which is 15·8 lower than that for last year. There was one death from Bright's disease.

Diseases of the Cutaneous System.—There were 48 admissions, or a ratio of 137·9 per 1,000 of the strength, which, when compared with the rate for last year, shows an increase of 36·9 per 1,000. The bulk of the admissions were for ulcers, caused in many instances by mosquito bites.

CONDITIONS.—*Debility*.—There were 28 admissions under this heading, giving a ratio of 80·5 per 1,000, which is an increase of no less than 75·7 on the rate for last year. This condition in most instances was consequent on repeated attacks of ague.

POISONS.—There was one admission into hospital, and one death out of hospital, both from alcoholic poisoning.

INJURIES.—65 admissions are shown for *local injuries*, the rate of admission is 186·8 per 1,000, which is 48·8 lower than last year. 24 cases are returned under the heading of wounds, 24 as contusions, 10 as sprains, 6 as fractures, and 1 as a burn. There was no death. There were no surgical operations.

Officers.

In an average annual strength of 10 officers there were 6 attacks of illness, and no deaths. One officer was invalided to England on account of peritonitis.

Women.

In an average annual strength of 22 women there were 23 attacks of illness, and no death. Ague, debility, and hepatitis were the causes of admission.

*Children.**Mauritius*

In an average annual strength of 40 children of non-commissioned officers and men only 16 attacks of illness are shown, and 2 deaths. 13 of the admissions were due to ague, and the deaths were caused by ague and diarrhoea.

Invaliding.

Twenty-four non-commissioned officers and men were sent home from the Command as invalids during the year, being in the ratio of 68·96 per 1,000 of the strength, which is 28·09 per 1,000 higher than the rate for last year. Of these 12 were sent to England on account of paroxysmal fevers, 2 for phthisis pulmonalis, 2 for valvular disease of the heart, 1 for varicose veins, 1 for dyspepsia, 1 for fistula in ano, 1 for Bright's disease, 3 for debility, and 1 on account of fracture of the ulna. 13 men were finally discharged the service in the year.

Mean Daily Sick.

The average number of men constantly sick was 32·42, being in the ratio of 93·16 per 1,000 of the strength. The average sick time to each soldier was 34 days, and the average duration of each case of sickness was 11·17 days. Compared with the preceding year the ratio per 1,000 constantly sick is 11·48 higher, the average sick time to each soldier is 4·19 days longer, and the average duration of each case is ·43 days shorter.

X.—ON THE HEALTH OF THE TROOPS SERVING IN THE ISLAND OF CEYLON.

Sickness and Mortality.

STATISTICAL REPORT.

White Troops.

Ceylon.

The average annual strength of the non-commissioned officers and men in the Command was 881; the admissions into hospital were 1,041; the deaths including 2 of invalids sent home, were 17; the average number constantly sick was 49·55. The admission rate is therefore 1181·4, the death rate is 19·30, and the constantly sick rate is 56·24 per 1,000 of the strength. The rate of admissions is 191·3 per 1,000 men higher than in the preceding year; the death rate is 3·54 higher, and the constantly sick rate is 1·38 lower. The Corps which served in the Command during the year were the 12th and 13th Batteries of the 7th brigade of the Royal Artillery, the 57th and 102nd regiments, and detachments of the Royal Engineers, the Army Hospital Corps, and Staff and Departments. The changes in the Command were as follow: The 57th Regiment left it on the 22nd of February for the Cape of Good Hope; the 102nd Regiment arrived on the 19th of the same month.

Some of the most important of the health statistics of these corps are shown in Abstract No. XXXVII.

From this table it will be observed that the highest rate of admissions is given by the 102nd Regiment, while the highest rate of mortality is given by the 57th Regiment. The 102nd Regiment is almost composed of very young soldiers, unused to a tropical climate, but of 12 deaths in that corps, five have been from pulmonary disease, an unusual proportion from this station.

The admissions and deaths in the various orders of diseases are shown in Abstract No. XII.

GENERAL DISEASES.—In the *febrile* group 118 admissions are shown, giving a ratio of 133·9 per 1,000 of the strength which, is 69·1 per 1,000 lower than that for the preceding year. In the *constitutional* group there were 182 admissions or a ratio of 206·6 per 1,000, which is 95·3 higher than that for last year. The decrease in the first-mentioned group is due chiefly to a lower prevalence of paroxysmal fevers, the increase in the last-mentioned is due chiefly to a greater prevalence of syphilis. The death rate in the febrile group is 1·82 per 1,000 lower than in the previous year, while in the constitutional it is 2·71 higher.

Continued Fevers.—49 cases of simple continued fever are returned, and 34 of febricula, giving a ratio of 94·2 per 1,000 of the strength, which is 18·1 per 1,000 lower than the rate for last year. **Enteric Fever.**—No case occurred, and the exemption is said to be probably due to the fact that the drinking water was boiled before being used. There was no death, the rate of mortality is therefore ·99 lower than last year.

Paroxysmal Fevers.—There were only 20 admissions for these fevers, 14 of which are returned as ague, and 6 as remittent fever. The rate of admissions is 22·7 per 1,000, which is 59·1 lower than that for last year. There was one death from remittent fever at Galle. The death rate is 1·14 per 1,000 higher than in the preceding year.

Cholera.—A case of choleraic diarrhœa is returned, which occurred at Colombo, otherwise there was an entire exemption from this disease.

Rheumatism contributed 27 admissions, or a ratio of 30·7 per 1,000 of the strength, which is 13 per 1,000 higher than the rate for last year.

Syphilis.—109 admissions are shown for the primary, and 25 for the secondary form of the disease. The rate of admission is 152·1 per 1,000, which is 71·3 higher than that for the previous year. The Contagious Diseases Ordinance seems to be very imperfectly applied in the Island.

Tubercular Diseases.—There were 17 admissions under this heading, and 5 deaths, giving ratios respectively of 19·3, and of 5·67 per 1,000 of the strength. Compared with the preceding year the admission rate is higher by 7·5 per 1,000 men, and the death rate by 2·71. 13 of the admissions were for phthisis pulmonalis, and 4 for tubercular hæmoptysis. The deaths, 4 of which occurred in the Command, and 1 in an invalid at Netley, were all from phthisis pulmonalis.

LOCAL DISEASES.—*Diseases of the Nervous System* gave only 6 admissions, and there was no death. The rate of admissions is 7·0 lower, and the death rate 1·97 per 1,000 lower than last year.

Diseases of the Eye.—There were 18 admissions giving a ratio of 20·4 per 1,000 of the strength, which is higher than the rate for last year.

Diseases of the Circulatory System.—The number returned under this heading is 10, and there was one death. The rate of admissions is 8·4, and the death rate 1·14 per 1,000 higher than that for 1878. Eight of the admissions were for palpitation. The death was due to fatty degeneration of the heart.

Diseases of the Absorbent System.—52 admissions are shown under this heading, giving a ratio of 59·0 per 1,000 of the strength, which is 4·8 per 1,000 higher than the rate for last year. 26 cases are returned as inflammation of the glands, and 24 as suppuration of the glands. No information is given regarding the cause of the high rate of prevalence of these affections, but as syphilis was very rife in the Command it is not improbable that the two complaints may be closely identified.

Diseases of the Respiratory System.—There were 29 admissions and 2 deaths, giving ratios respectively of 32·9, and of 2·27 per 1,000 of the strength. Compared with the preceding year the admission rate is 10·2, and the death rate is 2·27 per 1,000 higher. 26 of the admissions were for bronchitis and bronchial catarrh. The two deaths were from pneumonia.

Diseases of the Digestive System.—The total number returned for diseases of this group is 246, and there were 7 deaths. The rate of admissions is 105·8 per 1,000 higher than that for last year, and the death rate is 2·03 per 1,000 higher. Dysentery, diarrhoea, hepatitis, and dyspepsia caused the great bulk of the admissions; the deaths were caused by abscess of the liver (4), dysentery (2), jaundice (1).

Diseases of the Urinary System.—Under this heading 53 cases of gonorrhoea, 19 of sequelæ of gonorrhoea, and 9 other diseases of this group are shown. The rate of admissions is 19·1 per 1,000 men higher than that for last year.

Diseases of the Cutaneous System.—There were 123 admissions for affections of this system, the rate differs but little from last year.

CONDITIONS.—*Debility*.—Only 7 cases are returned under this heading, the rate of admissions is 10·8 per 1,000 lower than last year.

POISONS.—There were 5 admissions for delirium tremens, and 2 for alcoholic poisoning, giving a ratio of 7·9 per 1,000 of the strength, which is identical with that for last year.

INJURIES.—One death is shown under the heading of *general injuries*, and there were 102 admissions for *local injuries*. The rates differ but little from last year. The death was caused by a fall from the ramparts of the Fort at Galle. There were no surgical operations.

Officers.

In an average annual strength of 46 officers, there were 34 attacks of illness, 1 death, and 4 were invalided to England, being in the ratios respectively of 739, 21·73, and of 86·95 per 1,000. Simple continued fever was the chief cause of the admissions, the death was due to apoplexy, and the invaliding was caused by phthisis pulmonalis (2), bronchitis (1), general debility (1).

Women.

In an average annual strength of 56 women, the wives of non-commissioned officers and men, there were 23 attacks of illness, and 2 deaths, being in the

Ceylon.

rates respectively of 410·71, and of 35·71 per 1,000 of the strength. 8 of the admissions were for general debility, 6 were cases of parturition, and 5 of simple continued and remittent fevers. The deaths were due to gastritis and general debility.

Children.

In an average annual strength of 102 children of non-commissioned officers and men, only 13 attacks of illness are returned, and there were two deaths. The deaths were due to convulsions.

Invaliding.

Twenty-five non-commissioned officers and men were sent home to England as invalids during the year, being in the ratio of 28·39 per 1,000 of the strength, which is lower by a small fraction than that for last year. The causes of invaliding were: phthisis pulmonalis (4), epilepsy (2), dementia (2), hemiplegia (1), iritis (1), impaired vision (1), dyspepsia (1), dysentery (4), hepatitis (5), chronic synovitis (1), abscess of the cellular tissue (1), ulcer (1), multiple injury (1). The number of men finally discharged the service in the year as invalids was 14.

Mean Daily Sick.

The average number of non-commissioned officers and men constantly sick was 49·55, being in the ratio of 56·24 per 1,000 of the strength. The average sick time to each soldier was 20·53 days, and the average duration of each case of sickness was 17·37 days. Compared with the preceding year the rate of constantly sick is 1·38 higher, the average sick time to each soldier is 2·95 days more, and the average duration of each case is ·35 days less.

Native Troops.

The native troops consisted of a company of gun lascars distributed between the stations of Colombo, Trincomalee, and Galle. The average annual strength was 87, the admissions into hospital 54; there was no death. One man was invalided. The average number daily sick was 2·10.

XI.—ON THE HEALTH OF THE TROOPS SERVING IN CHINA AND THE STRAITS SETTLEMENTS.

Sickness and Mortality of the Troops in China and the Straits Settlements.

STATISTICAL REPORT.

I.—White Troops.

In an average annual strength of 1,876 non-commissioned officers and men there were 1,742 admissions into hospital, and 13 deaths, including those of three invalids sent home; and the average number constantly sick was 100·07. The admission rate is therefore 928·5, the death rate is 6·92, and the constantly sick rate 53·34 per 1,000 of the strength. Compared with the preceding year the rate of admissions is 176·2 per 1,000 men lower, the rate of deaths is 6·10 lower, and the constantly sick rate is 7·12 lower.

The proportions in which the two divisions of the Command contributed to these results are shown in the following Table:—

Stations.	Average Annual Strength.	Admissions into Hospital.	Died.			Invalided home.	Average Daily Sick.	Ratio per 1,000 of Strength.				Average Sick time to each Soldier.	Average duration of each case of Sickness.
			In the Com- mand.	Of Invalids.	Total.			Admissions.	Deaths.	Invalided.	Average daily Sick.		
Hong Kong	982	932	6	1	7	62	64·31	940·0	7·13	63·13	65·48	Days. 23·90	Days. 25·18
Straits Settlements.	894	810	4	2	6	13	35·76	906·0	6·71	14·54	40·00	14·60	16·10

The admission rate for the Hong Kong division of the Command is 2·1 per 1,000 men lower than in the preceding year, and the death rate is 5·90 lower.

For the Straits Settlements division the admission rate is 353·5 per 1,000 men lower, and the death rate is 6·32 per 1,000 lower.

The Troops stationed in the Command during the year were the 7th and 9th batteries of the 14th brigade, Royal Artillery, a detachment of the Royal Engineers, the 2nd battalion of the 3rd, the 27th, the 28th, and 74th regiments, a few non-commissioned officers of the Garrison Staff, a detachment of the Army Hospital Corps, and two non-commissioned officers of the Army Service Corps.

Certain particulars regarding the sickness in each of the corps serving in the Command are shown in Abstract No. XXXVII. By this table it will be observed that the health of all the corps in the Command was satisfactory. The highest rate of admissions, 1203·7 per 1,000, is given by the 2nd battalion of the 3rd regiment, quartered at various stations in the Straits Settlements, but there was no mortality. The regiment only arrived in the Command on the 29th of November; the next highest rates of admissions are given by the 27th and 74th regiments, which are respectively 982·0 and 958·6 per 1,000, and they give also the highest rates of mortality, viz., 8·32 and 8·56 per 1,000 respectively. The first-named corps was stationed at Hong Kong almost throughout the year, the last named was at Hong Kong up to March, and in the Straits Settlements

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from that month until December, when it left the Command for England. The health of the other corps in the Command was exceptionally good, and there was no mortality except in the 28th regiment, in which the rate is only 5·75 per 1,000.

The admissions and deaths in the various classes and orders of diseases are shown in Abstract No. XIII.

GENERAL DISEASES.—252 admissions are shown in the *febrile group*, giving a ratio of 134·3 per 1,000 of the strength, which is 75·2 lower than the rate for last year. In the *constitutional group* 282 cases are returned, or a ratio of 150·3 per 1,000, which is 4·3 lower than last year. The rate of mortality is lower by 1·09 per 1,000 in the febrile group, and by 2·20 in the constitutional group than in the previous year.

Eruptive Fevers gave 14 admissions, or a ratio of 7·5 per 1,000, which is 6·9 higher than the rate for last year, when there was but one admission. 13 were cases of measles, and one is returned as dengue. There was no mortality.

Continued Fevers.—134 admissions are shown under this heading, of which 123 were for febricula, 7 for simple continued fever, and 4 for enteric fever; there was 1 death, which was due to the latter affection. Compared with the preceding year the rate of admissions for these three varieties of fever combined is 2·9 per 1,000 men lower, and the rate of mortality is 1·09 per 1,000 lower. 100 out of the 134 admissions took place at Hong Kong. All of the cases of enteric fever occurred at that station.

Paroxysmal Fevers caused 99 admissions, or a ratio of 52·8 per 1,000 of the strength, which is 68·7 lower than the rate for last year; there was no death in either year. 51 of the cases occurred at Hong Kong, the others were distributed pretty evenly throughout the various stations in the Straits Settlements. 89 of the admissions were for ague and 10 for remittent fever.

Rheumatism.—36 cases of this disease are shown, giving a ratio of 19·2 per 1,000 men, which is 5·2 per 1,000 lower than the rate for last year.

Syphilis.—156 cases of primary and 21 of secondary syphilis are shown, the rate for the two affections combined being 94·4 per 1,000 of the strength, which is 17·9 per 1,000 higher than the rate for last year. 86 of the admissions were at Hong Kong, and the increased prevalence of the disease at that station is attributed to the exemption of the brothels set apart for the Chinese portion of the population from the provisions of the Contagious Diseases Ordinance.

Tubercular Diseases.—The total number returned for these affections is 68, of which 62 are shown as cases of phthisis pulmonalis. The rate of admissions is 36·2, which is 14·8 lower than that for last year. One death occurred in an invalid at Netley, sent home for phthisis.

LOCAL DISEASES.—*Diseases of the Nervous System.*—The number admitted for diseases of this system was 26, giving a ratio of 13·9 per 1,000 of the strength, which is 6·3 per 1,000 higher than the rate for last year. There were four deaths, or a ratio of 2·13 per 1,000, which is 1·04 per 1,000 higher than that for the preceding year. The deaths were due to meningitis (2), and sunstroke (2), 10 of the admissions were for pleurodynia.

Diseases of the Eye caused 31 admissions, or a ratio of 16·5 per 1,000 of the strength, which is 4·6 higher than that for 1878. 19 of the cases are shown as conjunctivitis.

Diseases of the Circulatory System gave 63 admissions, or a ratio of 33·6 per 1,000, which is less by nearly half than the rate for the preceding year. There was no mortality, 48 of the cases are returned as palpitation.

Diseases of the Respiratory System.—There were 87 admissions for diseases of this system, giving a ratio of 46·4 per 1,000 of the strength. There was no death. Compared with the preceding year, the rate of admission is lower by nearly half. Bronchitis and bronchial catarrh caused the bulk of the admissions.

Diseases of the Digestive System.—The total number returned for diseases of the digestive system is 251, or a ratio of 133·8 per 1,000 men, which when compared with the preceding year gives a lower rate by 19·2. The deaths were four in number, three of which occurred in the Command, and one among the invalids sent home, the rate of mortality is 2·13 per 1,000, which is fractionally lower than that for last year. The principal causes of admissions were diarrhoea (74), dyspepsia (65), hepatitis (26), dysentery (17), &c. The deaths were due to dysentery in all instances.

Diseases of the Urinary System.—187 admissions are shown for gonorrhœa, 40 for sequelæ of gonorrhœa, and 13 for other diseases of this system, the rate of admission for all combined being 127·9 per 1,000 of the strength, which when compared with the rate for the preceding year gives an increase of 5·3 per 1,000. One death occurred from Bright's disease in an invalid on his passage to England.

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CONDITIONS, &c.—Debility.—50 admissions are shown under this heading, giving a ratio of 26·7 per 1,000 of the strength, which is 2·3 per 1,000 higher than the rate for 1878.

POISONS.—14 men were admitted, all for delirium tremens. The rate of admission is 7·5 per 1,000 men, which when compared with the rate for last year shows a fractional decrease. There was no death.

INJURIES.—Local.—200 cases of local injury are shown, but no death resulted. The rate of admission is 106·6 per 1,000 for all injuries combined, which is a little higher than that for last year. The causes of admissions were burns and scalds (3), contusions (3), fractures (11), wounds (72), sprains (50), dislocations (3), blisters of feet (28). One of the wounds was *self-inflicted*, a sergeant of the Royal Artillery having cut his throat while suffering under depression aggravated by indulgence in alcohol, it did not, however, prove fatal. The only very serious accident was that of a compound comminuted fracture of the thigh, the result of a fall from the upper storey of Victoria Barracks, Hong Kong, the sufferer being at the time in a state of intoxication. There were two *surgical operations* for amputation of finger.

Officers.

In an average annual strength of 81 officers there were 31 attacks of illness, being in the ratio of 382·71 per 1,000 of the strength, which is 174·25 per 1,000 lower than the rate for last year. There was no death. Two officers were invalided to England, one for diarrhœa and one for inflammation of the glands.

Women.

In an average annual strength of 108 women, the wives of non-commissioned officers and men, 42 attacks of illness are shown and two deaths, giving ratios respectively of 388·88 and of 18·51 per 1,000 of the strength, which when compared with last year gives a lower rate for the admissions by 87·31, and for the deaths by 10·06 per 1,000. Diarrhœa and general debility were the principal causes of admission. The deaths were due to dysentery and diarrhœa.

Children.

In an average annual strength of 171 children of non-commissioned officers and men, 114 attacks of illness are returned, and 18 deaths, being in the ratios respectively of 666·66, and of 105·26 per 1,000 of the strength, which when compared with the rates for the preceding year shows an increase of no less than 360·54 for the admissions, and of 49·14 for the deaths. Of the attacks 64 were measles, 12 diarrhœa, 8 general debility, &c. The deaths were due to measles (4), enteric fever (1), tabes mesenterica (4), convulsions (2), croup (1), diarrhœa (5), and general debility (1). It is stated by the Principal Medical Officer "that the principal cause of much of the sickness amongst the children may be attributed to the want of suitable nourishment, milk, the most important food for them, being a very expensive article of diet and beyond the means of the private soldier."

Invaliding.

Seventy-five men were sent home to England as invalids during the year, being in the ratio of 39·97 per 1,000 of the strength, which is 48·47 lower than that for last year. 40 men were invalided home for tubercular diseases, 39 of which were phthisis pulmonalis, 1 for secondary syphilis, 5 for diseases of the nervous system, 3 for diseases of the eye, 14 for diseases of the circulatory system, 12 of which were organic diseases of the heart, 4 for affections of the respiratory system, 2 for diseases of the digestive system, 1 for Bright's disease, 4 for debility, and 1 in consequence of a fracture of the thigh.

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Mean Daily Sick.

The average number constantly sick was 100·07, giving a ratio of 53·34 per 1,000. The average sick time to each soldier was 20·53 days, and the average duration of each case was 22·11. Compared with the preceding year the rate of constantly sick is 7·12 lower; the average sick time to each soldier is 1·54 days shorter, and the average duration of each case of sickness is 2·14 days longer.

ASIATIC TROOPS.

The Asiatic Troops in the Command consisted of a company of Gun Lascars stationed at Hong Kong, having an average annual strength of 88 non-commissioned officers and men. The admissions into hospital were 103, being in the ratio of 1170·4 per 1,000 men. There were two deaths, being in the ratio of 22·72 per 1,000 men. The average number constantly sick was 3·54, being in the ratio of 40·22 per 1,000 of the strength. The deaths were from aneurism of the aorta, and bronchitis. The average number constantly sick was 3·54, giving a ratio of 40·22 per 1,000 of the strength. The average sick time to each soldier was 14·69 days, and the average duration of each case of sickness was 12·55 days. Compared with the preceding year the rate of constantly sick is 1·87 higher; the average sick time to each soldier is ·69 days longer, and the average duration of each case is 4·95 days shorter.

ON THE HEALTH OF THE TROOPS SERVING IN INDIA.

Sickness and Mortality.

The average annual strength of the non-commissioned officers and men in *India* was 49,537; the admissions into hospital were 94,696, and the deaths 1,282, of which 1,212 took place in India, and 70 (being those of invalids) on the passage to or after arrival in England. The average number of constantly sick was 3673·87. The ratios from these numbers are, for admissions 1911·6, for deaths 25·88, and for constantly sick 74·16 per 1,000 of the strength.

The sickness for each of the three Commands is shown in the following Table :—

	Average Annual Strength.	Admitted into Hospital.	Deaths.			Invalids sent Home.	Invalids discharged the Service.	Constantly sick.
			In India.	Of Invalids.	Total.			
Bengal - -	29,129	58,830	882	52	934	1,272	730	2231·18
Madras - -	10,507	14,737	173	13	186	467	233	685·00
Bombay - -	9,001	21,129	157	5	162	596	205	757·69
Total - -	49,537	94,696	1,212	70	1,282	2,335	1,168	3673·87

continued.

	Ratio per 1,000 of Mean Strength.					Average Sick time to each Soldier.	Average duration of each case of Sickness.
	Admitted.	Died.	Invalids sent Home.	Invalids discharged.	Constantly sick.		
Bengal - -	2019·6	32·06	43·68	25·06	76·60	Days. 27·96	Days. 13·84
Madras - -	1402·6	17·70	44·45	22·18	65·19	23·80	16·97
Bombay - -	2134·0	16·34	60·19	20·60	76·53	27·93	18·09
Total - -	1911·6	25·88	47·14	23·58	74·16	27·07	14·16

BENGAL.

STATISTICAL REPORT.

The average annual strength of non-commissioned officers and men remaining in Bengal proper during the year 1879 was 29,129. All regiments which had crossed the N.W. frontier on field service having been deducted, their medical statistics will be treated separately in a general medical history of the two Afghan Campaigns of 1878-'79-'80. The decrease of strength as compared with that of the previous year is 6,218, and indicates the additional forces required on field service during the year. The aggregate strength, instead of having been reduced, had, in reality, been increased to a considerable degree, partly by the arrival of British regiments from the Madras and Bombay Presidencies, and

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partly by additional troops which arrived from England, or were detained in Bengal pending the conclusion of hostilities.

The number of admissions into hospital was 58,830, and of deaths (including those of 52 invalids on their passage home or after their arrival in England) 934, and the average number of daily sick was 2231·18. The annual admission rate per 1,000 men was 2019·6, exceeding that of the previous year by 420. The annual death rate per 1,000 men was 32·06, exceeding that of the previous year by 9·88. The average daily sick rate for the year per 1,000 of the strength was 76·60, exceeding that of the previous year by 11·46.

The number of invalids sent home was 1,272, giving an annual rate per 1,000 men of 43·66, which exceeds that of the previous year by 1·02. The number of invalids finally discharged the service during the year was 730, or 25·06 per 1,000 of the strength.

The total rate of loss for the year by deaths, and final discharge of men from the service, amounted to 57·12 per 1,000 of the strength.

The admissions, deaths, and invaliding in the different classes and orders of diseases are shown in Abstract No. XIV.

GENERAL DISEASES.—The rates of admissions and of deaths per 1,000 of the strength from the *febrile group* of diseases exceed those of the previous year by 383·7 and 4·59 respectively. In the *constitutional group* the rate of admissions per 1,000 of the strength is 11·5 lower, and of deaths is ·70 higher than the respective rates under these headings for the previous year.

Eruptive Fevers.—From this class of fevers the admissions amounted to 123 and the deaths to 3, giving annual rates per 1,000 of 4·2 and ·10 respectively. The former rate is 1 per 1,000 higher than the corresponding rate for the previous year, and the latter is exactly half that of the previous year. Small-pox caused 30 admissions, chicken pox 6, measles 22, scarlet fever 1, and dengue 64. The three deaths were from small-pox.

Continued Fevers.—The admissions under this heading were 4,908, and the deaths 118, giving annual rates of 168·5 and 4·05 per 1,000, being respectively lower than the corresponding rates for the previous year by 25·1 and ·73 per 1,000. Enteric fever caused 263 admissions, simple continued fever 2,565, and febricula 2,080. The deaths were 117 from enteric fever, and 1 from simple continued fever.

Paroxysmal Fevers.—The very large increase apparent in this class of fevers during 1878 is still more marked in the year now under report. The admissions were 25,154, or 863·5 per 1,000, and the deaths 75, or 2·58 per 1,000; the former rate showing an increase of 403·5, and the latter of 1·25 per 1,000, as compared with the corresponding rates for the previous year.

Cholera caused 281 admissions and 241 deaths, the annual rate of the former being 9·6 per 1,000, exceeding the corresponding rate for the previous year by 3·6, and the annual rate of the latter being 8·27, exceeding that of the previous year by 4·09, or in other words nearly double.

Other Diseases.—The admissions under this heading were erysipelas 67, influenza 12, mumps 6, pyæmia 1, diphtheria 1; and the deaths, erysipelas 2, of which one was that of an invalid, pyæmia 1, and diphtheria 1.

Rheumatism caused 1,122 admissions and 2 deaths, the rate of the former being 38·5 per 1,000, or 1·6 lower than that for the previous year, the death rate is ·07 per 1,000, as compared with *nil* during the previous year.

Syphilis in the primary form caused 2,240 admissions, and in the secondary 808 admissions and 3 deaths, including one among invalids. The annual rate of the former is 76·9 per 1,000, and of the latter 27·7, giving a total annual rate of 104·6 per 1,000, which is lower than the corresponding rate for the previous year by 10·7 per 1,000. The death rate under secondary syphilis, ·10 per 1,000, exceeds that of the previous year, under the inclusive term syphilis, by ·05.

Tubercular Diseases.—From this class of diseases the admissions were 202 and the deaths, including those of 26 invalids, were 59, giving annual ratios per 1,000 of 6·9 and 2·03, the former being slightly lower, and the latter slightly higher, than the corresponding rates for the previous year. Of the total number of deaths 58 were from pulmonary consumption, and one from tubercular hæmoptysis.

Scurvy and Purpura.—The admissions under this heading, 22 in number, give an annual ratio of ·8 per 1,000.

Other Diseases.—The admissions under this heading were anæmia 83, *Bengal.* diabetes 5, general dropsy 4, cancer 2; and the deaths were, anæmia 3, cancer 2, among the latter being included the death of an invalid after arrival in England.

Local Diseases.—As compared with the previous year an increase is observed in the admission rate from diseases of the digestive system amounting to 32·6 per 1,000, cutaneous system 5·6, respiratory system 4·4, nervous system 1·1 and in slightly varying degrees throughout the majority of other classes of local diseases, except in those of the urinary system in which a decrease of 10·4 per 1,000 has occurred, of the generative system 1·5, of the eye 1·2, of the absorbent system ·1. In the death rate an increase occurred under diseases of the nervous system of 2 per 1,000, the chief causes of death having been sunstroke 70, apoplexy 22, meningitis 10, epilepsy 3, abscess of brain 3; under diseases of the digestive system there was an increase of 1·46 per 1,000, the chief causes of death having been abscess of liver 62, dysentery 59, diarrhoea 9, hepatitis 9, enteritis 6; from diseases of the respiratory system an increase of ·80 per 1,000, and in smaller fractional degrees under diseases of the organs of locomotion, of the ductless glands, and of the urinary and generative systems; a slight decrease is observed in the death rate from diseases of the circulatory system, of the ear, and of the cutaneous system.

CONDITIONS, &c.—Debility.—An increase of 13·5 per 1,000 is observed in the admission rate, and of ·08 per 1,000 in the death rate from the diseases included under this ill-defined heading.

Poisons.—A fractional increase appears in the admission and death rates from the diseases classified under the effects of poison, the chief of these being delirium tremens, from which there were 68 admissions and 9 deaths; the other deaths were 2 from alcohol, and 1 from chlorodyne.

Injuries.—The sub-division of the disabilities arising from accident or violence in the returns for 1879 into *general* and *local* injuries and those received in action differs from that hitherto employed in not recording under separate headings accidental, homicidal, and *self-inflicted* injuries, as also those inflicted in accordance with the sentence of judicial or military authority. Under *general* injuries there were 31 admissions, of which 27 were from accidental burns and scalds, of which probably a large proportion would be more correctly returned among *local* injuries, 2 were from accidental and 1 from *suicidal* asphyxia by drowning, and 1 from over-lying. The deaths amounted to 15, viz., from burns and scalds 1, accidental asphyxia by drowning 8, over-lying 1, plugging of air passages 1 (out of hospital), *multiple injury, suicidal* (out of hospital) 1, *suicidal asphyxia by drowning* 3, 1 of which occurred in hospital. The ratio per 1,000 was of admissions 1·1 and of deaths ·52. Under *local* injuries there were 2,555 admissions, of which 1,096 were from contusions, 698 from sprains, 502 from wounds, 109 from fractures, and 29 from dislocations. Among the wounds were 10 *self-inflicted*, viz., cut throat 1, not specified 6, and gunshot 3. Four cases of corporal punishment occurred in the military prisons. The deaths amounted to 23, viz., from *gunshot* (*suicidal*) 10, of which 7 occurred out of hospital, 3 from concussion of brain, 2 from fracture of skull, 3 from fractures, 1 from gunshot, 3 from rupture of spleen, and 1 from rupture of bladder. The ratio per 1,000 was of admissions 87·7 and of deaths ·79.

Surgical Operations.—Admissions into hospital under this heading are not recorded separately in the table above given, but are specially noticed in the periodical returns by medical officers under the headings of the diseases or injuries during the treatment of which surgical operations became necessary. The operations during 1879 amounted to 11, viz., excision of fatty tumour 1, ligation of radial artery 1, paracentesis of abdomen 2, operation for phimosis 1, for epithelioma 1, amputation of finger 2, and not specified 3.

Abstract No. XV. taken from the reports of the Principal Medical Officer shows the admissions and deaths which took place at the chief stations in the Command.

On scrutiny of this table the broad facts typical of the medical events of the year become apparent, viz., the strikingly greater prevalence of disease and the mortality consequent thereon throughout the North-West Provinces and the Punjab. In the Presidency district sickness and mortality were extremely light. Calcutta, which means Fort William, is lowest, with a ratio of 836

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admissions per 1,000 and a mortality of only 5·67, the former rate being lower than that for the previous year by 160 per 1,000 and the latter by 1·50.

In the Allahabad division sickness and mortality attained much higher rates than in the Presidency, but were lower at Dinapore, the station nearest to the Presidency, than at any of the others.

In the Oudh division Lucknow is the only station available for comparison, as variations in the rates of sickness and mortality among such small strengths as those of Fyzabad and Sitapur are accidental. At Lucknow the admission rate of 1,518 per 1,000, and the death rate of 19·87 per 1,000, were both rather higher than the corresponding rates for the previous year, but compared with the rates for all Bengal for the year under report were much below the average.

The Rohilcund district maintains its long recognised character as regards the healthiness of its climate. The death rate at Bareilly, 5·49 per 1,000, is the lowest recorded among the principal stations, being '18 per 1,000 less than that of Fort William, whereas the admission rate of Bareilly exceeds that of Fort William by 508. As an instance, however, of the liability of death rates of even the most healthy stations to striking variations, on comparing one year with another it may be noticed that at Bareilly in 1878, among an average annual strength less by 150 than that for 1879, the deaths amounted to 29, giving an annual death rate of 50·08 per 1,000, notwithstanding that during that year, as well as during 1879, the proximity to the convalescent dépôt of Naini Tal must have relieved Bareilly of many serious and perhaps of some fatal cases. At the smaller stations of Ranikhet and Choubattia the troops also enjoyed exceptionally good health. The admission rate for 1879 at Shahjahanpur exceeds that of the previous year by 562 per 1,000, and at Moradabad it is more than doubled. The death rate for 1879 at Shahjahanpur exceeds that of the previous year by 2·31 per 1,000, and at Moradabad is less than that of the previous year by '72. The total result for the year is that in an annual average strength of 1,602 in the Rohilcund district there were 2,469 admissions and 12 deaths, giving the respective annual ratio of 1,541 and 7·49 per 1,000.

In the Saugor district the three stations of Nowgong, Saugor, and Jubbulpore were remarkably healthy, the total average strength was 942; the admissions were 1,305, and there were only 9 deaths, giving the respective annual rates of 1,385 and 9·55 per 1,000. Compared with the previous year the admission rate is almost the same, but the death rate is only fractionally more than one-fourth.

In the Gwalior district, so frequently pre-eminent for unhealthiness, this undesirable reputation was maintained during 1879. The ratio of sickness for the whole district was 2,101, and the mortality reached 37·73 per 1,000, and in the station of Morar the admissions, in a strength of 1,046, amounted to 2,275, and the deaths to 50·67 per 1,000. The admission and death rates at fortress Gwalior and Jhansi were also high.

The whole of the Meerut division participated in the universally prevailing epidemic of malarious fever, which prostrated the entire population of the North-West Provinces at the end of the rainy season of 1879. At Delhi, in a strength of 418, the admissions reached the extraordinary rate of 4,629 per 1,000, and the death rate, although below the general average for the year, was 23·92 per 1,000. At Muttra, in a strength of 421, the admission rate was 2,907, and the death rate 49·88 per 1,000, chiefly from enteric fever. At Meerut and Agra the admission and death rates were also high. At Futtehgarh, in a small strength of 142, the admission rate was 2,556 per 1,000, but no deaths occurred. Roorkee continued to maintain its healthy repute, in a strength of 322 there were 405 admissions and 3 deaths, giving the annual rates of 1,258 and 9·32 respectively per 1,000. At the hill station of Chakrata, in an average annual strength of 83, composed chiefly of old and young soldiers found unfit for field service with their regiments, the occurrence of 5 deaths caused a death rate for the year of 60·24 per 1,000.

In the Sirhind division the death rate of Subathu, in an average strength of 334, amounted to 44·91, chiefly in consequence of a short but severe outbreak of cholera in hospital among men of the 70th Regiment. The outbreak began on the 12th and ended on the 15th September, 10 cases and 9 deaths occurred; in seven of the cases the patients had already been under treatment for enteric

fever. The disease was entirely confined to the hospital, and was not prevalent elsewhere in the neighbourhood, although two cases among natives at the adjacent hill station of Kasauli, 13 miles off, were reported as having occurred on the same day as did the outbreak at Subathu. The hospital is situated on a detached hill at a considerable distance, 300 feet higher than the station generally. At Jullundur, chiefly from the prevalence of malarious fevers, the admissions, in an average strength of 204, were 623, and the deaths 7, being at the annual rates of 3,054 and 34·31 per 1,000 respectively. With the exception of the heavy floods and inundations from the Beas River in 1878, no explanation is offered for this unusual sickness and mortality. Umballa, Dagabai, and Solon enjoyed for the year a fair degree of health. Further West, and indeed all through the Punjab, the ratios are very high.

In the Lahore division the stations of Amritsar, Govindgarh, Ferozepore, and Mooltan, notwithstanding the very high admission rate at the first-named station of 4,786 per 1,000, and of somewhat less than half that rate at the two following stations, may all be considered healthy, the death rates of each, except that of Mooltan, where the mortality amounted to 16·69 per 1,000, being considerably less than half of the total average death rate of the year. But at Meen Meer, and Fort Lahore, with an admission rate of 4,102 and 3,275, and a death rate of 42·30 and 25·00 per 1,000 respectively, the health conditions were most unfavourable, chiefly from the prevalence of malarious fevers, with the accessory of cholera, during the prevalence of which disease, from April to June, the moving of the affected troops into camp, although decidedly beneficial as regards checking the progress of cholera among them, entailed an amount of continuous exposure to an exceedingly high temperature, which, among men already much debilitated by previous residence at unhealthy stations, must have very much increased their liability to the attacks of malarious fever, and its numerous complications and sequelæ. At Fort Kangra, in the small average annual strength of 61, the admissions were 292, and the deaths 5, giving the respective annual rates of 4,787 and 81·97 per 1,000. Malarious fevers were here also the prevailing diseases.

In the Rawul Pindi Command the statistics become still more unfavourable. The mortality chiefly from cholera having progressed westward in a steadily increasing wave. Sialkot, among the larger stations, with an average strength of 725 for the year, heads the mortality with 59 deaths, being at the rate of 81·38 per 1,000. Rawul Pindi, in an average strength of 1,431, has 47 deaths, equal to 32·84 per 1,000 of strength. The occupation of Khyra Gully by a battery of Royal Artillery from 10th June till 13th August, represents an annual average strength of 25, among whom the occurrence of 6 deaths from cholera caused the enormous annual death rate of 240·00 per 1,000. The ratio of mortality at Kooldunna, 116·67 per 1,000, is due to the 4th Battalion Rifle Brigade being encamped there on return from Afghanistan infected with cholera and in generally exhausted condition. At Fort Attock, also chiefly in consequence of cholera, the mortality amounted to 80·46 per 1,000. Campbellpore was occupied by a small strength, and maintained its high character for healthiness, the death rate having been 17·86 per 1,000. Some other stations present still more favourable figures, of which the explanation is probably to be found in their having been occupied by troops during the healthier portions of the year, and their having escaped cholera.

In the Peshawur district the statistics of Hoti Murdan, with a strength averaged for the whole year of 46, among whom, without any death having occurred, the annual rate of admissions, amounted to 5,413 per 1,000, are misleading, and are to be explained by the fact of the station having been occupied only for a limited time and during the sickly season. Such a rate as 5,413 per 1,000 had not been reached elsewhere, and would not have been maintained all the year round. At Peshawur and Nowshera the admission rates were not inordinately high, but the death rate of the former was 73·15, and of the latter 49·18, per 1,000, cholera and malarious fevers in each instance having been the chief causes of mortality.

Troops on the march fared little, if at all better, than their comrades in barracks. It is well known that they were required to march at the most dangerous time of year, and through districts, every stage of which had been marked by victims of cholera. The annual rate of admissions among them amounted to 1,204, and of deaths to 56·63 per 1,000.

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At the Hill depôts and other hospitals the admissions were at the annual rate of 1,792, and the deaths at the annual rate of 52·36 per 1,000.

The prevalence of sickness and the mortality from the different classes of diseases in each of the administrative circles are shown in Abstract No. XVI., which is taken from the report of the principal medical officer:—

GENERAL DISEASES.—Compared with 1878 there is an increase in the rate of admissions for all divisions except for the Lahore and troops on field service, the increase varies from 926·1 per 1,000 in the Peshawur division to 26·0 in the Sirhind division; a decrease of 123·7 per 1,000 is apparent in the Lahore division, and of 870·30 per 1,000 among troops on field service. The death rate is higher for the Presidency, Allahabad, Meerut, Lahore, Rawul Pindi, Peshawur, on the march, field service, and at the Hill depôts. The rates of increase vary from 84·76 per 1,000 men for the Peshawur division to ·10 for the Presidency.

For diseases of the *febrile group* the rate of admissions is higher for all the divisions except for the Lahore and for troops on field service. The increase amounts to 27 per 1,000 men for the Presidency, 400 for Allahabad, 167 for Oudh, 216 for Rohilcund, 151 for Saugor, 447 for Gwalior, 870 for Meerut, 49 for Sirhind, 760 for Rawul Pindi, 964 for Peshawur, on the march 326, Hill depôts 542. The decrease is 44 per 1,000 men for the Lahore division and for men on field service 818.

For diseases of the *constitutional group* the rate of admissions is higher for the Presidency division by 10 per 1,000 men, for Allahabad by 16, for Rohilcund by 37, for Saugor by 14, for Gwalior by 49, and for Hill depôts by 14. The rate is lower for the Oudh division by 37, for Meerut by 30, for Sirhind by 23, for Lahore by 79, for Rawul Pindi by 29, for Peshawur by 38, troops on the march by 22, and on field service by 52.

The death rate from diseases of the *febrile group* per 1,000 men is lower in the Presidency division by ·33, Allahabad by ·41, Oudh by 17·87, Rohilcund by 9·03, Saugor by 19·47, Gwalior by 11·63, and Sirhind by ·52, and higher in the Meerut division by 3·96, Lahore by 5·56, Rawul Pindi by 23·32, Peshawur by 83·94, troops on the march by 82·94, on field service by 31·52, and at Hill depôts by 4·31 per 1,000 men. The enormous variations given above indicate in striking terms the passage of the wave of cholera and malarious fevers, which, starting from the Gwalior and Oudh divisions in the second and third quarters of 1878, and acquiring increased virulence in transit, continued during 1879 to advance over almost the whole of north-western India and across the Himalayas into Afghanistan.

The death rates per 1,000 men from diseases of the *constitutional group* present only slight variations as compared with those for the previous year, an increase of ·43 is apparent in the Presidency division, of 1·48 in Allahabad, of 1·06 in Saugor, of 1·81 in Gwalior, of ·82 in Peshawur, of ·65 among troops on the march, and of ·31 on field service; a decrease of ·05 is apparent in the Oudh division, of 1·39 in Rohilcund, of ·32 in Meerut, of ·94 in Sirhind, of ·72 in Lahore, of ·31 in Rawul Pindi, and of ·63 in the Hill depôts.

Eruptive Fevers.—Compared with the previous year, an increase in the rates of admissions from this class of fevers is observed, amounting per 1,000 in the Meerut division to 18·7, in the Sirhind division to 4·8, and in smaller proportions in the Rawul Pindi, Peshawur, and Lahore divisions, and at the hill depôts; a decrease of 13·4 per 1,000 occurred in the Presidency division, owing to the cessation of the outbreak of dengue, of 6·1 in the Oudh division, 4·1 in the Allahabad, 4·4 in Gwalior, and in lower proportions in Rohilcund and Saugor. In the death rates an increase of ·32 per 1,000 (as compared with *nil*) occurred in the Lahore division, and of ·10 in Oudh; a decrease from 1·00 per 1,000 to *nil* in Gwalior, from ·46 to *nil* in Rohilcund, from ·29 to *nil* in Rawul Pindi, from ·23 to *nil* in Meerut, and (as compared with the fractional death rate of the previous year) a decrease of ·02 in Allahabad. The enumeration of the cases according to their nature has been given in a preceding paragraph.

Continued Fevers.—The variations in the rates of admissions and deaths from this class of fevers in the several divisions as compared with the previous year were as follows: an increase in the Peshawur division of 199·9 per 1,000.

Presidency 186·7, Oudh 105·6, troops on the march 33·3, and in the Saugor division 3·1; a decrease in the Rawul Pindi division of 125·0 per 1,000, Lahore 121·0, Sirhind 120·1, hill depôts 79·4, Rohilcund 78·1, Allahabad 34·7, Gwalior 31·8, Meerut 23·4. The death rates show an increase in the Rawul Pindi division of 5·46 per 1,000, among troops on the march 3·41, Peshawur division 1·56, and in fractional proportions in the Allahabad Presidency and Oudh divisions; a decrease in the Rohilcund division of 9·35 per 1,000, Saugor from 7·14 to *nil*, Sirhind 6·67, Gwalior 2·51, Lahore 1·79, hill depôts 1·35, and in the Meerut division ·18. The total mortality under this class of fevers was 118, of which 1 was attributed to simple continued fever, and the remainder to—

Enteric Fever.—A discrepancy may be observed in the numbers of cases and deaths under this heading, as previously given in the remarks on *Continued Fevers*, and those given in Abstract No. XVII. In the former, based on the annual returns, which contain the results of the revision and correction of diagnosis in cases of recovery and death, the number of cases is 263, and of deaths 117; in the latter, based on the monthly returns, the cases are 291 and deaths 116. The difference, however, not being sufficient to materially influence the results, the following ratios are calculated on the numbers of cases and deaths given in Abstract No. XVII., and the average annual strengths of divisions given in Abstract No. XVI. The rates of admissions per 1,000 of strength were in the Oudh division 19·6, Sirhind 16·5, Rawul Pindi 16·2, Peshawur 14·0, Meerut 10·5, Gwalior 8·4, Allahabad 5·9, Lahore 5·7, troops marching 5·2, Rohilcund 4·1, Saugor 1·1, Presidency ·7. The disease in the Oudh division prevailed chiefly during the first and second quarters in the station of Lucknow, and during the same period a few cases occurred at Fyzabad. In the Sirhind division the disease prevailed during the third and second quarters, the highest number of cases having occurred at Subathu. In the Rawul Pindi division the highest number of cases occurred in the station of Rawul Pindi, during the second and fourth quarters, and at Sialkot during the second and third quarters, at the other stations the cases occurred chiefly during the second and third quarters. In the Peshawur division, Cherat during the third quarter presented the highest number of cases, while at Peshawur and Nowshera the disease was more frequent during the second and third quarters. In the Meerut division the highest numbers of cases occurred at Muttra during the fourth, second, and third quarters. In the Gwalior district the highest numbers of cases occurred in the first and third quarters, the numbers in the second and fourth quarters being equal. In the Allahabad division the highest numbers of cases occurred in the station of Allahabad during the fourth and third quarters, and at Cawnpore during the third quarter. Among troops marching the second quarter furnished the majority of cases. In the Lahore division the station of Meen Meer during the second, first, third, and fourth quarters furnished the majority of the cases, in the other stations the cases occurred during the second, first, and fourth quarters. In the several stations of the Rohilcund division cases occurred chiefly during the second, third, and fourth quarters. Taking the total result the highest numbers of cases occurred during the second and third quarters, the numbers during the fourth and first quarters being respectively not quite half of those in the second and third. The death rates amounted to 9·24 per 1,000 in the Rawul Pindi division, chiefly in the stations of Sialkot and Rawul Pindi in third, second, and fourth quarters; 5·91 per 1,000 in the Peshawur division, chiefly in the stations of Peshawur during second and third quarters. Nowshera in the second quarter, and Cherat in the third; 5·26 in the Meerut division, chiefly in the station of Muttra in the second, fourth, and third quarters; 4·81 in the Oudh division, chiefly in the station of Lucknow in the second, first, and third quarters; 4·50 in the station of Morar, Gwalior in the fourth, second, third, and first quarters; 3·30 in the Sirhind division, chiefly in the station of Subathu during the third and second quarters; 3·24 among troops marching, chiefly during the second quarter; 2·67 in the Allahabad division, chiefly at Cawnpore during the third quarter; 1·89 in the Lahore division, chiefly at Meen Meer in first and second quarters, and at Ferozepore in the second and fourth; 1·75 in the Rohilcund division, at Shahjahanpur in the first, Bareilly in the second, and Moradabad in the third quarter; and ·70 in the Presidency division at Dum Dum, during the first quarter. The

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total number of deaths was distributed as follows, 44 in the second quarter, 39 in the third, 20 in the fourth, and 13 in the first.

Paroxysmal Fevers.—In the rates of admissions under this heading, in all except the Presidency division, very high proportions of increase as compared with the previous year are observed, as follows: Meerut division 874·2 per 1,000, Rawul Pindi 860·9, Peshawur 657·7, hill depôts 604·3, Gwalior 506·0, Allahabad 442·8, Rohilcund 298·8, Sirhind 185·8, Saugor 165·5, troops on the march 133·7, Oudh 94·1, and in the Lahore division 61·5. The decrease in the Presidency division amounted to 149·2 per 1,000. In the death rates, in all except the Lahore and Sirhind divisions, increase is apparent in the following proportions per 1,000, Peshawur 5·02, Gwalior 3·56, Meerut 2·93, Rawul Pindi 2·76, troops on the march 2·76, hill depôts 2·12 as compared with *nil*, Allahabad 1·78 as compared with *nil*, Oudh 1·31, Rohilcund 1·17 as compared with *nil*, Saugor 1·06 as compared with *nil*, and in the Presidency division ·43. The decrease in Lahore was at the rate of 3·39 per 1,000 and Sirhind 2·09.

Cholera.—A table showing the stations in the Bengal Command at which the admissions and deaths from cholera took place in each of the four quarters of the year is given in Abstract No. XVIII. The numbers of cases and deaths in this table so much exceed those given in Abstract No. XIV. as to render any calculations based upon them misleading in regard to the distribution of prevalence of this disease in the several military divisions among troops stationed throughout the year in the Bengal command. The chief cause of the discrepancy will probably be found to be that Abstract No. XVIII, based on the monthly returns, contains the cases and deaths occurring among the various columns and detachments marching towards or returning from Afghanistan. It is intended as already stated to furnish a general medical history of the two Afghan Campaigns of 1878-79-80, these cases are therefore excluded from the annual returns of troops stationed in Bengal throughout the year. The table in Abstract No. XVIII., however, very strikingly indicates the sweep of the advancing wave of cholera over the north-west and Punjab into Afghanistan. The prevalence of the disease was most marked in the second quarter, extending with diminishing intensity into the third, almost vanishing during the fourth, and non-existent during the first.

Rheumatism.—The total rate of admissions is 1·6 per 1,000 lower than that of the previous year, and the death rate is ·07 per 1,000 as compared with *nil*. The decrease of admissions in the Peshawur division amounted to 23·0 per 1,000, Sirhind 9·3, Lahore 8·0, Rawul Pindi 5·8, Meerut 5·4, Allahabad 5·1, Oudh 4·6, and Saugor 2·8. An increase of 35·9 occurred in the Rohilcund division, 12·0 in Gwalior, 4·9 among troops marching, 3·0 at the hill depôts, and 1·3 in the Presidency division. The death rates per 1,000 were ·71 at the hill depôts, and ·32 in the Lahore division as compared with *nil* during the previous year.

Syphilis.—Under the inclusive term syphilis, the admission rate per 1,000 is lower than that of the previous year by 10·7. The decrease amounted in the Lahore division to 71·0 per 1,000, Oudh division 33·0, among troops marching 29·5, Peshawur division 29·3, Meerut 25·1, Rawul Pindi 23·5, Sirhind 12·5, Rohilcund 4·8. An increase in admissions of 36·4 occurred in the Gwalior division, 30·2 in Saugor, 20·1 at the hill depôts, 18·0 in Allahabad, and 10·7 in the Presidency division. The death rates of ·54 per 1,000 in the Peshawur division, and ·37 in the Oudh division, show an increase as respectively compared with *nil* during the previous year, and a decrease to *nil* in the hill depôts from ·69 per 1,000 in the previous year, from ·48 in the Presidency division, and from ·23 in the Meerut division. The total death rate in the command ·07 per 1,000 exceeds that of the previous year by ·05.

Under Primary Syphilis the admission rates per 1,000 were, in the Allahabad division 139·0, Rohilcund 106·2, Rawul Pindi 92·4, Saugor 91·4, Meerut 79·8, Presidency 72·9, Oudh 67·0, among troops marching 51·3, hill depôts 50·2, Gwalior 48·9, Lahore 48·0, Peshawur 43·5, and in the Sirhind division 39·1.

Under Secondary Syphilis the admission rates per 1,000 were 56·6 in the hill depôts, 53·1 in the Saugor division, 52·5 in Rohilcund, 46·1 in Gwalior, 35·9 in Allahabad, 26·0 in Sirhind, Oudh 24·8, Lahore 24·6, Peshawur 21·0, Meerut 20·7, Rawul Pindi 19·9, Presidency 18·2, and among troops marching 5·8. The death rates were in the Peshawur division ·54 per 1,000, and in the

Oudh ·37, as respectively compared with *nil* during the previous year. The *Bengal*. death rate in the whole Command was ·10 per 1,000.

Tubercular Diseases.—The total rate of admissions was ·5 per 1,000 lower, and of deaths in the Command ·06 lower than the corresponding rates of the previous year. The decrease of admissions was 3·8 per 1,000 at the hill depôts, 2·7 in Saugor division, 2·1 in Gwalior, 2·1 in Lahore, 1·7 in the Presidency, 1·3 in Sirhind, and 1·1 in Oudh. An increase of 7·8 per 1,000 occurred in Peshawur division, 3·5 in Allahabad, 1·7 in Meerut, 1·0 in Rawul Pindi, ·1 among troops marching, and ·1 in Rohilcund. The death rate was higher by 1·25 per 1,000 in Gwalior division, by 1·19 in Allahabad, as compared with *nil* during the previous year, 1·06 in Saugor, as compared with *nil* during the previous year, ·74 at the hill depôts, ·28 in Peshawur, and ·22 in the Presidency. A decrease in the death rate of 1·39 per 1,000 occurred in Rohilcund division, 1·04 in Lahore, ·79 in Oudh, ·62 in Sirhind, ·08 in Meerut, and ·02 in Rawul Pindi; no deaths occurred among troops marching during either year.

Scurvy and Purpura.—Of 22 admissions into hospital under this heading, 14 occurred in the Lahore division, 11 of these being in the 68th Regiment at Meen Meer. The medical officer remarks that the occurrence of the disease cannot be accounted for, as there had never been a deficiency of vegetables throughout the year. In all the cases the patients had been very subject to ague, and had become anæmic in consequence. The entry in Abstract No. XVI. of a death in the Allahabad division from this class of disease which does not appear in Abstract No. XIV., is probably to be accounted for by its having occurred in the year 1878, during the interval between the closing of the last monthly return for that year and the first of January 1879, and being necessarily carried forward into the first monthly return for that year, and not appearing in Abstract No. XIV., which is prepared from the annual returns embracing only the period between 1st January and 31st December of each year.

Other Diseases.—Under this heading anæmia is the chief cause of admissions and of deaths; 83 cases and three deaths occurred, being in the respective proportions of 2·8 and ·10 per 1,000. The distribution of the several other diseases according to divisional commands is not given in Abstract No. XVI.; but from the fact of the total number of such cases having been 94, and deaths five, one of the latter having occurred in England, it may be seen at a glance that the highest rates of admissions were 9·9 per 1,000 in the Rohilcund division, 6·4 in Peshawur, 4·4 in Oudh, and 4·1 in Lahore. The death rates were ·70 per 1,000 in the Presidency division, ·65 among troops marching, ·56 in Gwalior, and ·37 in Oudh.

LOCAL DISEASES.—Diseases of the Nervous System.—In this class the total admission rate is higher than that of the previous year by 1·1 per 1,000. The increased rate is, among troops on the march 13·4, per 1,000, Rawul Pindi division 5·5, Meerut 8·8, Peshawur 8·2, hill depôts 3·4, Rohilcund 3·3, Oudh 3·1, and Presidency ·1. The admission rate is lower than that of the previous year by 7·2 per 1,000 in Saugor, 5·5 in Lahore, 2·8 in Sirhind, 1·9 in Gwalior, and ·9 in Allahabad. In the total death rate an increase of 2 per 1,000 occurred, distributed as follows—troops marching 9·09 per 1,000, as compared with *nil*, Peshawur 8·51, Rawul Pindi 3·32, Meerut 2·53, Saugor 2·47, Allahabad 1·89, Rohilcund 1·49, Oudh 1·06, Lahore ·79, and Presidency ·22; a decrease in the death rate is apparent in the Sirhind division of 1·67 per 1,000, hill depôts to *nil*, as compared with 1·38 per 1,000, and Gwalior ·13 per 1,000.

Diseases of the Eye.—The total admission rate under this heading 16·8 per 1,000, is lower than that of the previous year by 1·2. The highest admission rate, 27·0 per 1,000, occurred in the Oudh division, and the lowest, 4·0 per 1,000, among troops marching. The decrease in the Sirhind division was 9·0 per 1,000, 8·0 in Lahore, 7·9 in Gwalior, and in lower proportions in Rawul Pindi, Rohilcund, Meerut, and Saugor. An increase in the admission rate of 8·5 per 1,000 occurred in the Peshawur division, and in lower proportions in the Oudh, Presidency, and Allahabad divisions, at the hill depôts and among troops marching.

Diseases of the Circulatory System.—The total admission rate under this heading is 16·3 per 1,000, being higher than that of the previous year by ·9. The total death rate, including one death of an invalid in England, is ·82,

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being lower than that of the previous year by ·17. The admission rate exceeds that of the previous year in the Presidency division by 19·2 per 1,000, in Rohilcund by 17·5, at the hill depôts, by 16·1, in Meerut by 3·6, Allahabad by 2·8, Gwalior by 2·6, and among troops marching by ·7. The admission rate is lower in Rawul Pindi by 9·2 per 1,000, Lahore by 6·7, Oudh by 6·1, Saugor by 3·7, Peshawur by ·9, and in Sirhind by ·3. The death rate is lower than that of the previous year in the Saugor division by 2·51 per 1,000, Gwalior ·88 Oudh *nil*, as compared with ·81, Presidency ·76, Lahore ·68, Rohilcund *nil*, as compared with ·42, Sirhind ·42, Allahabad *nil*, as compared with ·31. The death rate is higher than that of the previous year in Rawul Pindi division by 1·65 per 1,000, at the hill depôts by ·73, Meerut by ·70, among troops marching by ·65, as compared with *nil*, and in Peshawur by ·15. The cases admitted to hospital were as follows: palpitation 367, valvular disease 48, varicose veins 32, hypertrophy 7, pericarditis 6, aneurism of aorta-thoracic 6, ditto abdominal 6, aneurism of subclavian artery 1, femoral artery 1, angina pectoris 1, and occlusion, vessel not stated, 1. The causes of death were—valvular disease 8, including one of an invalid in England, aneurism of thoracic-aorta 5, fatty degeneration 4, aneurism of abdominal aorta 3, aneurism of femoral artery 1, pericarditis 1, dilatation of heart 1, and occlusion, vessel not stated, 1.

Diseases of the Respiratory System.—The total admission rate from this class of disease 60·3 per 1,000, and the total death rate 1·68 per 1,000, respectively exceed the corresponding rates for the previous year by 4·4 and ·80 per 1,000. The increase in the admission rate was in the Gwalior division 39·1 per 1,000, Peshawur 21·7, Rawul Pindi 13·9, among troops marching 13·1, at hill depôts 9·8, Meerut 7·1, and in the Presidency division 3·6; a decrease in admission rate of 42·6 per 1,000 occurred in the Saugor division, 27·9 in Lahore, 11·9 in Sirhind, 11·5 in Oudh, 6·2 in Rohilcund, and 3·1 in Allahabad. The increase in the death rate was, among troops marching 2·76 per 1,000, in the Lahore division 2·13, Peshawur 1·90, Gwalior 1·75, Rawul Pindi ·80, at the hill depôts ·74, Meerut ·70, Oudh ·47, and Allahabad ·29, as compared with *nil*; a decrease in death rate of 1·61 per 1,000 occurred in the Saugor division, in Rohilcund to *nil* as compared with 1·28, and of ·52 in Sirhind; in the Presidency division no deaths occurred during either year.

The causes of admission were bronchitis and bronchial catarrh 1,426, pneumonia 194, pleurisy 70, laryngeal catarrh 25, asthma 19, hæmoptysis 8, laryngitis 7, passive congestion of lungs 2, abscess of lung 1, acute pneumonic phthisis 1, empyema 1, emphysema 1. The causes of death were pneumonia 31, including 3 deaths of invalids in England—bronchitis 9, pleurisy 3, laryngitis 2, abscess of lung 1, passive congestion of lung 1, pulmonary extravasation 1, acute pneumonic phthisis 1.

Diseases of the Digestive System.—The total rates of admissions under this heading 266·8 per 1,000, and of deaths 5·73, exceed the corresponding rates for the previous year by 32·6 and 1·46 respectively. The increase of admission rate was in the Peshawur division 210·5, among troops marching 175·2, Rawul Pindi 140·9, at hill depôts 103·3, Presidency 64·1, Gwalior 54·9, and Lahore 38·4; a decrease in admission rate of 66·1 per 1,000 occurred in the Sirhind division, 47·6 in Oudh, 43·3 in Saugor, 32·1 in Rohilcund, 12·3 in Allahabad, and 1·5 in Meerut. The increase of the death rate was 5·21 in Rawul Pindi division, 5·04 in Peshawur, 2·60, as compared with *nil*, among troops marching, 1·99 in Gwalior, 1·71 in Meerut, 1·18 in Allahabad, ·85 at the hill depôts, Rohilcund ·21, and ·12 in Lahore; a decrease of death rate to *nil*, as compared with 8·03 per 1,000, occurred in the Saugor division, of 2·11 in Sirhind, ·84 in Oudh, and ·82 in Presidency.

Abstract No. XIX. contains a statement of the prevalence of dysentery, diarrhœa, and hepatitis in each of the divisions of the Bengal Command, and the deaths caused thereby, and Abstract No. XX. shows the prevalence of and mortality from the same diseases in each quarter of the year in the Bengal Command.

Diseases of the Urinary System.—The total rate of admissions from this class of disease, 159·7 per 1,000, is lower than the corresponding rate of the previous year by 10·4; the death rate ·28 per 1,000 exceeds that of the previous year by ·03. In the total number of 4,653 admissions gonorrhœa caused 3,846, and its sequelæ 403, or 913·2 under both heads per 1,000 of the total number of

admissions. The deaths, 8 in number, were from "other diseases," viz.: Bright's disease 7, nephritis 1. The decrease in the admission rate was 83·4 per 1,000 in the Oudh division, 52·6 in Saugor, 30·3 among troops marching, 26·6 in Rawul Pindi, 23·5 in Lahore, 22·1 in Sirhind, 19·9 in Gwalior, 9·3 in Meerut, and 1·8 in Allahabad. An increase in the admission rate of 67·7 per 1,000 occurred in the Presidency division, 32·9 at the hill depôts, 21·0 in Rohilcund, and 4·1 in Peshawur.

The increase of death rate was, as compared with *nil*, 71 per 1,000 at the hill depôts, 59 in Allahabad division, and 32 in Lahore, also as compared with the rate of previous year was, in Meerut and 06 in Gwalior. A decrease of death rate to *nil* occurred in Sirhind, as compared with 31 per 1,000, the death rate was also lower than that of the previous year in Rohilcund by 27, and in Rawul Pindi by 01 per 1,000. No deaths during either year occurred in the Presidency division, Oudh, Peshawur, and among troops marching.

Diseases of the Cutaneous System.—The total admission rate exceeds that of the previous year by 5·6 per 1,000. The increase of admissions as compared with the previous year was, in the Oudh division 29·8 per 1,000, at the Hill depôts 26·1, Rawul Pindi 17·1, Gwalior 15·2, Peshawur 15·0, among troops marching 9·8, Lahore 6·3, Rohilcund 4·3, and Meerut 3·1. A decrease of admissions occurred in the Presidency division amounting to 27·6 per 1,000, Saugor 25·8, Sirhind 17·3, and in Allahabad 2·7. In the Presidency division the death rate was *nil*, as compared with 48 per 1,000. No deaths occurred in any of the other divisions during either year.

CONDITIONS.—Debility.—Under this heading the total admission rate 44·3 per 1,000, and the total death rate 17 per 1,000, exceed the corresponding rates of the previous year by 13·5 and 08 per 1,000 respectively. The increase of admission rate is 67·4 per 1,000 in the Peshawur division, 37·3 in Gwalior, 33·1 in Rawul Pindi, 25·7 among troops marching, 19·4 in Sirhind, 17·7 in Lahore, 16·2 in the Presidency, 13·3 in Rohilcund, and 8·2 at the Hill depôts. A decrease of admissions amounting to 18·6 per 1,000 occurred in the Allahabad division, 4·6 in Saugor, 2·3 in Meerut, and 1·0 in Oudh. The death rate, as compared with *nil* during the previous year, was at the hill depôts 71 per 1,000, Presidency 70, Peshawur 54, and Meerut 31. The death rate was *nil* in Gwalior and Oudh, as compared respectively with 50 and 27 per 1,000 in the previous year, and it was 01 per 1,000 lower than that of the previous year in Lahore. In the other divisions no deaths occurred during either year.

POISONS.—The total admission and death rates under this heading exceed the corresponding rates of the previous year by 5 and 4 per 1,000 respectively. The highest rate of admissions 6·7, and of deaths 84 per 1,000, occurred in the Rawul Pindi division. The lowest admission rate, 1·1 per 1,000, occurred in the Oudh and Saugor divisions, in neither of which did any death occur. Delirium tremens caused 68 admissions or 618 per 1,000 of the total number, viz., 110, under poisons; 9 deaths were attributed to this disease and 2 to alcohol, giving in the total of 12 deaths the proportion of 917 per 1,000 as caused by excessive drinking; 1 death was caused by chlorodyne.

Officers.

The average annual strength of commissioned officers on the Bengal establishment serving in the Command throughout the year was 1,051, and in England or beyond sea 147, giving a total of 1,198. The number of cases of sickness among those in Bengal was 819, or 779·2 per 1,000, and of deaths in the Command 41, and in England or elsewhere 6, giving a total of 47, or 39·23 per 1,000 of the total strength in the Command and elsewhere. The rate of admissions exceeds that of the previous year by 12·40 per 1,000, and of deaths by 19·93. The chief causes of admission were paroxysmal and continued fevers, rheumatism, and affections of the digestive system. The causes of death in and out of India were enteric fever 6, simple continued fever 1, remittent fever 2, cholera 8, diphtheria 3, phthisis pulmonalis 2, apoplexy 3, sunstroke 2, fatty degeneration of heart 1, aneurism of thoracic aorta 2, pneumonia 2, hæmatemesis 1, dysentery 2, hepatitis 1, abscess of liver 1, simple enlargement of liver 1, cirrhosis of liver 1, gunshot wound accidental 1, gunshot wound *self-inflicted* 1, disease not known 6.

*Bengal.**Women.*

In an average strength of 2,421 wives of non-commissioned officers and men, there were 3,093 admissions (including 494 from childbirth), and 60 deaths, being in the respective annual ratios of 1277·5 and 24·78 per 1,000, these rates are lower than the corresponding rates for the previous year by 52·5 and 5·55 per 1,000 respectively. The chief causes of admission were paroxysmal and continued fevers, general debility, diseases of the digestive system, and of the eyes, principally conjunctivitis. Small-pox caused 12 admissions and 3 deaths. The other causes of death were enteric fever 1, simple continued fever 1, ague 1, remittent fever 7, cholera 6, puerperal fever 1, phthisis pulmonalis 6, anæmia 1, meningitis 1, sunstroke 5, paralysis not defined 1, mania 1, fatty degeneration of heart 2, fibrinous concretions in cavities of heart 1, bronchitis 1, pneumonia 1, dysentery 6, diarrhœa 3, abscess of liver 3, uterine hæmorrhage 1, abortion 1, childbirth 3, puerperal mania 1, pemphigus 1, debility 1.

Children.

The average annual strength of soldiers' children was 4,744, among whom occurred 3,965 admissions and 353 deaths, being in the respective annual ratios of 835·8 and 74·40 per 1,000, these ratios exceed the corresponding rates for the previous year by 30·8 and 3·86 per 1,000 respectively. The chief causes of admissions were paroxysmal, eruptive, and continued fevers, conjunctivitis, general debility, diarrhœa, teething, and bronchitis. There were 8 cases of small-pox but no death from this cause, measles caused 462 admissions and 39 deaths, scarlet fever 15 admissions and 4 deaths. The other causes of death were enteric fever 9, simple continued fever 5, febricula 4, ague 16, remittent fever 17, cholera 10, diphtheria 2, whooping cough 2, pyæmia 1, syphilis 1, tabes mesenterica 4, tubercular meningitis 2, anæmia 3, meningitis 3, apoplexy 1, sunstroke 1, chronic hydrocephalus 4, convulsions 60, croup 12, bronchitis 10, pneumonia 8, atelectasis 1, teething 17, sloughing sore throat 1, gastritis 1, enteritis 1, dysentery 14, diarrhœa 57, abscess of liver 1, jaundice 2, hæmaturia renalis 1, psoriasis 1, debility 27, premature birth 6, asphyxia by drowning 4, and wound 1.

Invaliding.

The number of non-commissioned officers and men sent home to England as invalids during the year was 1,272, or 43·66 per 1,000, which exceeds the rate for the previous year by 1·02. The number finally discharged the service was 730 or 25·06 per 1,000 of the strength. General debility was the most frequent cause of invaliding as also of final discharge from the service, 318 are given under the former heading and 236 under the latter being in the respective ratios of 10·92 and 8·10 per 1,000, affections of the digestive system come next in order as having caused the invaliding of 232 and the final discharge from the service of 110 men, or respectively 7·97 and 3·78 per 1,000. Paroxysmal fevers caused the invaliding of 172 and the final discharge of 4 men from the service, giving the next highest rate of invaliding, namely, 5·91 per 1,000, but with a rate of final discharge of only 1·14 per 1,000. In consequence of diseases of the circulatory system 107 men were sent home and 92 finally discharged, or 3·67 and 3·16 per 1,000 respectively. Diseases of the nervous system caused the invaliding of 93 and the final discharge of 31 men, or 3·19 and 1·06 per 1,000 respectively. Tubercular diseases caused 60 men to be invalided and 49 to be finally discharged, giving the respective rates of 2·06 and 1·68 per 1,000. Under rheumatism 49 men were invalided and 43 finally discharged, or 1·68 and 1·48 per 1,000 respectively. Secondary syphilis was the cause of the invaliding of 39 men and of the final discharge of 25, giving the respective rates of 1·34 and ·86 per 1,000. One man was sent home under primary syphilis. Diseases of the respiratory system caused 39 men to be invalided and 23 to be finally discharged or 1·34 and ·79 per 1,000 respectively. Under each of the other classes of disease only fractional rates of invaliding and final discharge are given.

*Mean Daily Sick.**Bengal.*

The average number of men constantly sick was 2231·18, being in the ratio of 76·60 per 1,000 of the strength; the average sick time to each soldier was 27·96 days, and the average duration of each case of sickness was 13·84 days. Compared with the preceding year the ratio per 1,000 constantly sick is 11·46 higher; the average sick time to each soldier is 4·18 days longer, and the average duration of each case 1·03 days shorter.

II.—MADRAS.

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STATISTICAL REPORT.

The average annual strength of the troops in the Command was 10,507 non-commissioned officers and men; the admissions into hospital were 14,737; the deaths (including those of invalids who died on their voyage home or after their arrival in England) were 186; and the average number constantly sick was 685. The admission rate is therefore 1402·6, the death rate is 17·70, and the constantly sick rate is 65·19 per 1,000 of the strength. Compared with 1878 the admission rate is 66·5, per 1,000 higher, the death rate is 5·55 per 1,000 lower, and the constantly sick rate is 2·84 per 1,000 higher.

The admissions and deaths in the different classes and orders of diseases are shown in Abstract No. XXII.

GENERAL DISEASES.—*Febrile Group.*—4,249 admissions are shown under this heading, giving a rate of 404·4 per 1,000 of the strength, which is 54·0 higher than the rate for last year. There were 47 deaths or a ratio of 4·47 per 1,000, which is 1·05 lower than that for last year. ***Constitutional Group.***—For this group 1,881 admissions are shown, giving a ratio of 179 per 1,000, which is higher by 11·1 than that for last year. The number of deaths was 14 or a ratio of 1·33 per 1,000, which is ·69 lower than that for last year.

Eruptive fevers caused only 4 admissions, which gives a lower rate than that for last year by 1·9; this is due to the greatly diminished prevalence of small pox. One case of small pox and three of measles formed the total number. No deaths occurred.

Continued Fevers.—1,382 is the number returned for all the fevers in this group, of which 998 were cases of simple continued fever, 372 of febricula and 12 of enteric fever, the rate of admissions is 131·5 per 1,000, which is 47·1 lower than that for the preceding year. There were 18 deaths or a ratio of 1·71 per 1,000, which is ·64 per 1,000 lower than that for last year. ***Enteric Fever.***—Of the 12 admissions for this disease 10 of the cases were fatal, but it is stated by the Principal Medical Officer that 5 of the admissions were corrections made after consideration of the post-mortem appearances, the cases having been in the first instance returned for simple continued and remittent fevers.

Paroxysmal Fevers.—2,793 admissions are shown for fevers of this group, of which 2,604 were for ague and 189 for remittent fever; the ratio per 1,000 of the strength for both combined is 265·8, which is 103·4 per 1,000 higher than that for last year. The deaths were 6 in number, 5 having been caused by remittent fever and one by ague, the rate of mortality is ·57 per 1,000, which is ·17 lower than for last year.

Cholera caused 36 admissions and 23 deaths, giving rates respectively of 3·4 and of 2·19 per 1,000 of the strength, both of which are fractionally lower than those for the preceding year. It prevailed at only two stations, in both as a recrudescence from an invasion in the previous year; but it also coincided nearly in point of time with the drying up of ground inundated by adjoining rivers. The fatality was 1 in 1·57 of those attacked.

Other diseases of this group.—There were 34 admissions for other diseases. Eight of those were for erysipelas and one for pyæmia, none terminating fatally.

Rheumatism.—The total number returned for rheumatic affections is 311, of which 142 were cases of the muscular, 97 of the chronic, 70 of the acute, and one of the gonorrhœal forms of the disease, a case of gout is also included under this heading. The rate of admissions is 29·6 per 1,000 or 3·6 lower than that

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for the preceding year. There was one death, giving fractionally a higher rate of mortality than last year.

Syphilis.—There were 1,191 admissions for the primary and 252 for the secondary form of the disease, giving rates respectively of 113·3 and of 24·0 per 1,000 of the strength. The rate of admissions for both combined is 12·2 per 1,000 higher than that for 1878. In the present year there was one death from secondary syphilis; in the previous year there was no mortality.

Tubercular diseases.—There were 66 admissions under this heading, of which 59 were for phthisis pulmonalis, 4 for tubercular hæmoptysis, and 3 for scrofula.

The rate of admissions is 6·3 per 1,000, which is fractionally higher than last year's. There were 11 deaths in the Command, and 1 among invalids sent home. The rate of mortality is fractionally lower than last year's.

Scurvy and Purpura.—There were 4 admissions for scurvy, all occurred in one battery of the Royal Artillery in Burmah. There was no admission for these diseases in the preceding year. *Other diseases.*—There were 57 admissions under this heading, most of which were for anæmia.

LOCAL DISEASES.—*Diseases of the the Nervous System* caused 216 admissions or a ratio of 20·6 per 1,000 of the strength, which is 4·0 per 1,000 higher than that for the preceding year. There were 23 deaths, 22 of which occurred in the Command, and one among the invalids. The rate of mortality is 2·19 per 1,000, which is 1·30 lower than that for 1878. More than one third of all the admissions were for neuralgia, next most numerous were the admissions for sunstroke 36, 13 of these latter were fatal, a third of the whole admissions and nearly a sixth of the deaths happened in a company of infantry marching in the month of May in the course of an ordinary relief; there were 26 admissions for various forms of mental disease, and 37 for epilepsy; there were 2 admissions for tetanus, one only being fatal.

Diseases of the Eye.—The number admitted was 179 or a ratio of 17 per 1,000, which is 1·7 higher per 1,000 than that for 1878. The operation of excision of the eye ball was performed in one instance, the eye being totally disorganised.

Diseases of the Circulatory System.—208 admissions are returned under this heading, giving a ratio of 19·8 per 1,000 of the strength, or a higher rate by 3·8 per 1,000 than that for the preceding year. The number of deaths was 10 or a ratio of ·95 per 1,000, which is ·43 lower than that for last year. The occurrence of a higher rate of admissions and a lower rate of deaths than last year is accounted for by the greater prevalence of palpitation in the year under report.

Diseases of the Respiratory System.—There were 386 admissions or a ratio of 36·8 per 1,000 men, which is 4·6 per 1,000 lower than that for last year. There were 6 deaths, 4 in the Command, and 2 among the invalids, the death rate is ·57 per 1,000, which is lower by a small fraction than that for 1878.

Diseases of the Digestive System.—The total number returned for diseases of this group is 3,159 or a ratio of 300·6 per 1,000 of the strength, which is 29·6 per 1,000 lower than the rate for the preceding year. The number of deaths was 58, of which 51 occurred in the Command and 7 among the invalids; the rate of mortality is 5·52 which when compared with that for the preceding year shows a decrease of 1·93, per 1,000 men. The diseases in which there was a diminished prevalence compared with that of 1878 are dysentery, in which the reduction is equal to 23·66 per 1,000, and the death rate is proportionately even more reduced; diarrhœa, in which the admissions were one seventh less in number, and hepatitis and hepatic abscess, which were a little less frequent in occurrence, and the death rate was also a little lower.

Diseases of the Urinary System.—There were 1,002 admissions for gonorrhœa, 138 for sequelæ of gonorrhœa, and 78 for other diseases of this group. The rate of admissions for all combined is 115·9 per 1,000, which is in excess of that for last year by 2·2, and is owing to an increase in gonorrhœa. There were 5 deaths, 4 from Bright's disease, and one is returned as caused by suppression of urine.

Diseases of the Generative System.—The total number returned for diseases of this group is 133. The rate of admissions is 12·7 per 1,000 men, which is 3·2 per 1,000 lower than that for last year.

Diseases of the Cellular Tissue.—There were 204 admissions, giving a ratio of *Madras*, 19·4 per 1,000 of the strength, which is nearly the same as that for last year.

Diseases of the Cutaneous System.—818 admissions are returned under this heading, giving a ratio of 77·8 per 1,000, being in excess of that for 1878 by 5·8 per 1,000.

CONDITIONS, &c.—Debility caused 461 admissions, or a ratio of 43·9 per 1,000 of the strength, which is 11·6 per 1,000 higher than that for last year. This excess is attributed to the greater prevalence of illnesses in the group of fevers and the prostration ensuing on them.

POISONS.—The number admitted was 27, and the ratio per 1,000 of the strength is 2·6, which is 3·3 lower than that for the preceding year. There was one death in the Command, which was due to poisoning with alcohol, and one of an invalid who committed *suicide* on his passage home by swallowing carbolic acid.

INJURIES.—4 admissions are shown under the heading of *General*, and 1,120 under that of *Local injuries*, giving ratios respectively of ·4 and of 106·6 per 1,000 of the strength. The rate for all injuries combined is 10·5 per 1,000 higher than that for last year; 3 of the admissions in this class were the result of judicial punishment (flogging), eight were due to *self-inflicted injuries*, viz., hanging 2, gunshot 4, and cut-throat 2. Six of the deaths were *suicidal* namely, drowning 1, hanging 2, gunshot 3. Of the accidental deaths, 1 was due to plugging of the air passages by food regurgitating from the stomach, 9 to drowning, 1 to the bite of a shark, 1 to gunshot wound, 1 to concussion of the brain, 1 to fracture of the skull. There was one admission from homicidal wound inflicted with a bayonet. There were no *surgical operations*.

The admissions, deaths, and invaliding at each of the principal stations are shown in Abstract No. XXIII.

The prevalence of sickness and mortality of the different classes of diseases in each of the Administrative Circles, are shown in Abstract No. XXIV., which is taken from the report of the Principal Medical Officer.

GENERAL DISEASES.—Compared with 1878 the rates of admissions for diseases of this class are higher in the Presidency Circle by 200·3 per 1,000 men, in the Mysore by 190·3, in the Hyderabad by 30, and in Burmah by 58·2 per 1,000. The rates of mortality are lower for every Circle, except that for Burmah which is higher by 6·4 per 1,000 men. With respect to the two groups of which this class is composed, diseases of the *Febrile group* are in a higher rate than in 1878, in the Presidency Circle by 180·75, in the Mysore by 61·73, in the Hyderabad by 31·25, and in the Burmah by 90·55. The death rates in this group are lower in the Presidency by 2·57 per 1,000, in the Mysore by ·51, and in the Hyderabad by 6·97, but higher in the Burmah by 5·51 per 1,000. For the *Constitutional group* the rates of admissions are higher than in the preceding year for the Presidency by 19·5 and for Mysore by 128·5, while for the Hyderabad and Burmah Circles they are respectively 1·2 and 32·4 per 1,000 men lower. The large increase in the Mysore Circle is chiefly due to syphilis. The rate of mortality from diseases in this subdivision is higher for Mysore by ·24, for Hyderabad by ·70, and for Burmah by ·91 per 1,000; it is lower for the Presidency by ·80. In the Depôts there was no death.

Eruptive Fevers.—There were only 4 admissions, 2 of which were in the Presidency Circles and 1 respectively in Burmah and at the Depôts, the decrease in the year under report is due to a diminution in the epidemic prevalence of small pox.

Continued Fevers.—The rates of admission are higher than those of the preceding year, for Mysore by 5·3, and for Burmah by 7·8 per 1,000 men; they are lower for the Presidency by 14·5, for Hyderabad by 145·4, and for the Depôts by 23·2 per 1,000 men. The death rate is higher for Mysore by 1·94, for Hyderabad by ·40, and for Burmah by 1·44 per 1,000 men; it is fractionally lower for the Presidency.

Enteric Fever.—The returns received from regiments showed only 8 admissions for this form of fever, but examination of the pathological appearances in 4 of the instances in which death occurred under the heading of simple

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continued fever, and in 1 under that of remittent fever, led to corrections, so that the admissions for enteric fever were increased to 12, and the deaths to 10.

The stations where cases of enteric fever occurred, and the months during which they were admitted into hospital, are shown in Abstract No. XXV., taken from the returns furnished by the Principal Medical Officer. From this table it will be observed that 5 of the admissions took place at Bangalore, one at Secunderabad, four at Kamptee, and one at Tonghoo, and that the fever was most prevalent in the months of August, July, and February. The ages and periods of residence in India of those attacked by enteric fever are also shown in this Abstract; from which it will be observed that the highest rates both of admissions and deaths occurred in soldiers between the ages of 20 and 22, and that 7 out of the 12 admissions and 6 of the 10 deaths took place in men whose service in India was under one year.

Paroxysmal Fevers.—Compared with the rates for the preceding year, that of the year under report is higher for the Presidency by 199, for Mysore by 58, for Hyderabad by 188, and for Burmah by 77, while that for the Depôts is lower by 79 per 1,000 men. The death rate however for these fevers is lower for every Circle than in 1878, that for the Depôts only being higher.

Cholera.—The prevalence of cholera was confined to two Circles, the Hyderabad and the Burmah, and cases occurred in only one station in each, viz., Kamptee and Thayetmyo. In the preceding year cases occurred among the troops in every Circle, in each of the Depôts, and amongst the troops on the march.

Rheumatism.—Compared with last year the rate of admission is higher for the Presidency fractionally, and for Mysore by 18·9 per 1,000 men, but it is lower for Hyderabad by 3·4, and for Burmah by 22·2 per 1,000. The rate for the Depôts is lower by one half.

Syphilis.—The rate of admissions is higher than that of the preceding year, for the Presidency by 18·1, for Mysore by 95·6, for Hyderabad by 2·0, and for the Depôts by 36·6, it is lower for Burmah by 14·8 per 1,000 men.

Tubercular Diseases.—The rates of admissions for the present and for the preceding year, do not differ importantly. The death rate is fractionally lower for the Presidency, but it is fractionally higher for each of the other Circles.

Scurvy and Purpura.—The admissions for Burmah Circle, in the rate of 1·44 per 1,000 men, compare with no admissions in the preceding year, they were all amongst the men of one battery of Artillery at the station of Tonghoo, and the illnesses were due not to the want of vegetables, but to the unsuitability of those issued for the requirements of health.

LOCAL DISEASES.—Diseases of the Nervous System.—The rate of admissions is higher than that of the preceding year, for the Presidency by 5·1, for Mysore by 12·4, and for Hyderabad by 5·8, but is lower for Burmah by 2·6 per 1,000. The death rate is higher for the Mysore Circle by 1·82 per 1,000 men, but it is lower for each of the other Circles, for the Presidency by 3·06, for Hyderabad by 1·34, for Burmah by 1·70 per 1,000 men; both the increase and the decrease in the rates of mortality in the various Circles are due substantially to the fact that deaths from sunstroke have been more frequent in the Mysore Circle, and less frequent in the others than in 1878.

Diseases of the Eye.—The rate of admissions is higher than in 1878, for the Presidency by 3·9, for Mysore by 7·4, and for Hyderabad fractionally, for the Burmah Circle it is lower by 2·6 per 1,000 men.

Diseases of the Circulatory System.—The rate of admissions is higher than that of the preceding year, for Mysore by 26·8 and for Burmah by 8·3 per 1,000 men. On the other hand it is lower for the Presidency by 8·0 and for Hyderabad by 3·7 per 1,000 men. Concurrently with a rate of decreased prevalence of diseases of this nature, in the Presidency there is a lower death rate, but in Mysore the much higher admission rate is associated with a considerably lower death rate. The comparatively excessive frequency of palpitation in the Circle causes this feature, the prevalence was nearly all confined to one regiment, the 48th, which returns 56 admissions for palpitation, for which disease, or symptom of a disease, 6 men of that regiment were invalidated during the year. Of the cases 49 occurred at Cannanore in the head-quarters of the regiment; the Medical Officer writes concerning the occurrence of palpitation, 49 cases were treated at Cannanore, out of which number 6 men were invalidated. The cases were purely functional, and attributable to the climate and habits of the men in drinking and smoking to excess.

Diseases of Respiratory System.—Compared with the preceding year the rate of admissions is higher for Mysore by 7·4 per 1,000 men, but it is lower for each of the other Circles. The death rates are lower for each Circle, excepting the Presidency in which no death occurred in either year.

Diseases of the Digestive System.—The rate of admissions is higher than that for 1878, for Mysore by 154·1, for Hyderabad it is lower by 151·2, and for Burmah by 62·5 per 1,000, while for the Presidency it is the same for both years. The death rate is fractionally higher for the Presidency, but lower for each of the other Circles, and for the Depôts and the troops on the march. The large increase in the rate of admissions for Mysore is due chiefly to the excessive prevalence of dyspepsia and hepatitis in the 48th Regiment at Cannanore; 154 cases of the former and 101 of the latter disease are returned in this corps.

The relative prevalence of certain important diseases of this order in each division of the Command, and the relation between the prevalence and mortality of the diseases specified are shown in Abstracts Nos. XXVI. and XXVII., taken from the report of the Principal Medical Officer.

Diseases of the Urinary System.—Compared with last year the rate of admissions is higher for the Presidency by 17·4, for Mysore by 29·5, and for Burmah by 7·4 per 1,000 men, but is lower for Hyderabad by 2·0 per 1,000. The increased rates for the Circles referred to are due nearly altogether to a greater prevalence of gonorrhœa.

Diseases of the Generative System, of the Organs of Locomotion, and of the Cellular Tissue do not show any important differences in the degrees of their prevalence in the various Circles from the rates of the preceding year.

Diseases of the Cutaneous System.—The rate of admissions is higher than in the preceding year, for Mysore by 25·5 and for Hyderabad by 2·8 per 1,000 men, but it is lower for the Presidency by 6·9 and for Burmah by 15·1 per 1,000.

CONDITIONS, &c.—Debility.—The rates for the various Circles are very unequal in the present year, that for Mysore, which is the highest, being no less than 85·5 in excess of that for Hyderabad, which is the lowest. The high rate of prevalence in Mysore was confined to the 48th regiment at Cannanore which corps appears to have been generally in a very cachectic condition, owing to its being stationed on the Malabar Coast for several years.

POISONS.—The rates of admissions in the different Circles do not differ materially; 23 of the 27 admissions were for delirium tremens, 3 for alcoholic poisoning, and one was due to taking an overdose of chlorodyne, which the man took of his own accord to procure sleep when suffering from the first symptoms of delirium tremens.

INJURIES.—The rates of admissions are not materially different in the various Circles from those of last year, except in Mysore where it is higher by 40·2 per 1,000 men.

The sickness and certain of the most important results of sickness in each corps serving in the Command are shown in Abstract No. XXVIII., taken from the report of the Principal Medical Officer.

Officers.

In an average annual strength of 433 officers, 299 were placed on the sick list during the year, and 3 died, being in the annual ratios respectively of 690·5 and of 6·93 per 1,000 of the strength. Compared with the preceding year, the rate of sickness is 87·8 per 1,000 lower, and that of deaths is 20·22 lower, or more than two-thirds below that of last year. Of the illnesses 1 was from small pox, 39 were from simple continued fever, 11 from remittent fever, and one officer was attacked with cholera at Thayetmyo. The deaths were due to paralysis 1, abscess of the liver 2.

Women.

The average annual strength of the wives of the non-commissioned officers and men was 1,108, there were 1,296 admissions into hospital, inclusive of 275 for childbirth and 20 deaths, being in the ratios of 1169·7 and of 18·06 per 1,000 of the strength respectively. The admission rate is lower by 73·7 per

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1,000 than for last year, and the death rate by 9·01. Febrile diseases, especially ague and general debility, were, as in the preceding year, the chief causes of admission. The deaths were due to simple continued fever 2, remittent fever 2, apoplexy 3, endo carditis, 1, bronchitis 1, gastritis 1, dysentery 2, bright's disease 2, debility 1, multiple injury 1, contusion 1, diseases incidental to the puerperal state 2, and syncope 1.

Children.

In an average annual strength of 2,109 children of non-commissioned officers and men there were 1,515 admissions into hospital and 113 deaths, being in the ratios of 718·3 and of 53·58 per 1,000 of the strength respectively. The admission rate is lower by 28·07, and the death rate by 18·99 than in the preceding year. Two of the admissions were for small pox, 4 were for chicken pox and 39 for measles; 186 children were admitted for ague and 6 for remittent fever, 18 for whooping cough, 2 for phthisis pulmonalis, and 10 for tabes; cholera caused 3 admissions, and croup 7.

The deaths were due to measles 2, simple continued fever 2, ague 3, remittent fever 2, cholera 3, whooping cough 1, tubercular meningitis 1, tabes mesenterica 3, anæmia 1, chlorosis 1, sunstroke 3, chronic hydrocephalus 2, convulsions 12, meningitis 1, valvular disease of the heart 1, croup 3, laryngitis 1, bronchitis 7, pneumonia 1, cancerum oris 1, teething 22, quinsy 1, tonsillitis 2, dysentery 9, intussusception 1, diarrhoea 14, jaundice 1, premature birth 1, debility 8, multiple injury 2, drowning 1.

Invaliding.

467 non-commissioned officers and men were sent home from the Command as invalids during the year, being in the ratio of 44·45 per 1,000 of the strength, which is 1·32 per 1,000 lower than the rate for last year. Of these, 6 were sent to England on account of diseases of the febrile group, 64 for those of the constitutional group, 110 for local diseases, and 6 for local injuries; 233 invalids were finally discharged the service in the year.

Mean Daily Sick.

The average number of men constantly sick was 685, being in the ratio of 65·19 per 1,000 of the strength; the average sick time to each soldier was 23·80 days, and the average duration of each case of sickness was 16·97 days. Compared with the preceding year the ratio per 1,000 constantly sick is 2·84 higher; the average sick time to each soldier is 1·04 days longer, and the average duration of each case is ·06 days shorter.

Bombay.

III.—BOMBAY.

STATISTICAL REPORT.

The average annual strength of the troops in this Command was 9,901. The admissions into hospital were 21,129 in number, the deaths from all causes, in and out of hospital, (including those of invalids on their passage home, or after their arrival,) amounted to 162, and the average daily sick was 757·69. The admission rate is therefore 2134·0 per 1,000 of the strength, or 328·7 higher, the death rate 16·34, or 5·31 lower, and that of the constantly sick 76·53, or 12·07 higher, than that for the preceding year.

The admissions and deaths in each class and order of diseases are shown in Abstract No. XXIX.

GENERAL DISEASES.—12,144 admissions are shown in the *febrile group*, being in the ratio of 1226·5 per 1,000 of the strength, which is 322·4 higher than the rate for the preceding year, the increase being due entirely to a greater prevalence of paroxysmal fevers. The death rate in this sub-division is 3·74, which is 4·86 per 1,000 men lower than that for last year. For the *constitutional group* 1,816 cases of disease are returned, being in the ratio of 183·4 per 1,000, or 34·3 higher than that for last year. There were 14 deaths in this group, giving a ratio of 1·41 per 1,000, which is lower, fractionally, than the rate for the preceding year.

Eruptive Fevers.—There were but three admissions in the whole Command, *Bombay*, viz., one respectively for small-pox, measles, and scarlet fever; there was no death.

Continued Fevers.—1,110 admissions are shown in the Abstract, of which 630 were for febricula, 452 for simple continued fever, and 28 for enteric fever giving a ratio for all combined of 112·1 per 1,000 of the strength, which is 21·6 lower than that for last year. There were 18 deaths from these fevers, giving a ratio of 1·82 per 1,000, which is ·71 lower than the rate for the preceding year. *Enteric fever* was less prevalent by nearly half than in the preceding year, and shows a lower rate of admissions than for the previous five years, while it is also lower than the average for 10 years 70–79. There were 17 deaths giving a ratio of 1·71 per 1,000, which is ·8 lower than that for last year, though nearly equal to the average for 10 years. The proportion of deaths to the number of cases is however higher by about 1 per cent. than in the preceding year. In 1878 this fever was most prevalent in the last half of the year. In the year under report there was no marked difference in the occurrence of cases throughout the various months of the year. As in previous years the young soldier recently arrived in the country showed a peculiar predisposition to the disease.

Paroxysmal Fevers.—11,015 admissions are shown under this heading, 10,506 of which are returned as cases of ague, and 509 as remittent fever. The rate of admissions is 1112·5 per 1,000 of the strength, which when compared with that for last year shows an increase of 357·4. There were 16 deaths, 14 of which were due to remittent fever, and two to ague, giving a ratio of 1·62 per 1,000, which is ·51 higher than that for last year. The increased prevalence was entirely confined to ague, remittent fever, having been less rife than in the preceding year. An excessive rainfall for two successive years is the cause assigned by medical officers for the increase.

Cholera.—Only 2 admissions and 3 deaths are shown from this disease against 57 and 47 respectively in the preceding year.

Rheumatism caused 363 admissions, 148 of which are returned as cases of muscular, 144 as chronic, 62 as acute, 5 as gonorrhœal, 1 as synoial, 1 as chronic osteo-arthritis; and 2 cases of acute gout are also shown. The rate of admissions is 36·7 per 1,000 men, which is slightly lower than that for last year. One death is recorded under acute rheumatism.

Syphilis.—1,080 cases of the primary, and 231 of the secondary form of the disease are shown, giving a ratio of 109·1 per 1,000 men for the former, and of 23·3 for the latter. The ratio for both combined is 30·3 per 1,000 higher than for last year. The Principal Medical Officer states that this increase indicates an unsatisfactory working of the Lock Hospital system, and has submitted to the authorities a series of recommendations with a view to lessening the disease.

Tubercular diseases.—There were 92 admissions for these affections, of which 75 were for phthisis pulmonalis, 16 for tubercular hæmoptysis, and 1 for scrofula. The rate of admissions is 9·3 per 1,000 men, which is 3·6 higher than that for last year. There were 12 deaths, (10 in the Command and two amongst the invalids,) giving a ratio of 1·21 per 1,000, which is ·21 lower than that for 1878. All the deaths were from phthisis.

LOCAL DISEASES.—Diseases of the nervous, circulatory, digestive, generative, and cutaneous systems of the eye, and of the organs of locomotion show lower rates of admission than last year, while those of the absorbent, respiratory and urinary systems, and of the ear, the nose, and the cellular tissue are higher. In most of the groups the difference is very small. The greatest decrease is in affections of the digestive system, where the rate is 214·6 or 36·8 per 1,000 lower. The most marked increase is in affections of the respiratory system, where the rate is 60·7, or 20 per 1,000 higher. The death rates are lower for diseases of the nervous and digestive systems than last year, but higher for those of the circulatory, respiratory, and urinary systems, while that for the organs of locomotion is the same in both years; there was no death in the other groups in either year. The most marked increase in the death rate for the year under report is in diseases of the respiratory system in which there were 25 deaths against one in 1878, or an excess of 2·43 per 1,000; 19 of these were from pneumonia, and no less than 11 occurred in the 1st Battalion of the 6th Regiment, the men of which were much debilitated from malaria contracted during service in Bengal. 5 of the deaths occurred in this corps on

Bombay.

its passage from Bombay to Aden in the month of November, and complaint was made of an absence of proper warm clothing for such weakly men in the cold season. The other 6 occurred at Aden soon after its arrival.

CONDITIONS.—*Debility.*—406 admissions are shown under this heading, giving a ratio of 41·0 per 1,000, which is 5·3 lower than the rate for the preceding year. There was one death.

POISONS occasioned 92 admissions, of which 21 are returned as delirium tremens, 68 as alcoholic poisoning, 2 as scorpion's sting, and 1 as poisoning by oxalic acid. The rate of admissions is 9·3 per 1,000, which is fractionally higher than that for last year. There were two deaths, one of which was occasioned by chloroform inhalation, the other by alcoholic poisoning.

INJURIES.—Under the heading of *general injuries* there was one admission, the deaths were 6 in number, 4 of which are shown as asphyxia by drowning, 1 as asphyxia by plugging of the air passages with food, and 1 as multiple injury. *Local injuries* caused 922 admissions, of which 372 are returned as contusions, 276 as sprains, 187 as wounds, 33 as blisters of the feet, 27 as fractures, 7 as dislocations, 4 as concussion of the brain, 4 as gunshot wounds, 2 of which were *self-inflicted*, and 1 as cut-throat, *self-inflicted*. There were 8 deaths, viz., 2 from concussion of the brain, and 2 from fracture which were accidental, 1 from gunshot wound which was homicidal, and 3 from gunshot wounds which were *self-inflicted*. The rate of admissions for injuries, *general* and *local*, is 93·2 and the death rate 1·42 per 1,000 of the strength, which are respectively 4·4 and ·51 lower than last year's.

Surgical Operations.—4 surgical operations were performed during the year, viz., 1 circumcision, 1 removal of sebaceous tumour, and 2 amputations of fingers.

The admissions and deaths in the principal stations in the Command are shown in Abstract No. XXX. furnished by the Principal Medical Officer. By this table it will be observed that the rate of admissions in the year under report is in excess of that of last year for all stations except Bombay, Deesa, Kirkee, Belgaum, and Asirgarh. The highest rates are given by Neemuch, which is 4,334 per 1,000 men, or 1,471 higher than for the preceding year; for Baroda, which is 3,256 or 491 higher; for Satara, which is 2,763 or 832 higher; for Indore which is 2,740 or 712 higher, and for Nasirabad, which is 2,734 or 629 higher. This large increase was, as in the previous year, due to an unusual prevalence of malarious fevers. The lowest rate is given by Deesa, which is 971 per 1,000 or 541 lower than for 1878. The highest death rates are given by Nasirabad, 36·73 per 1,000; Deolali, 33·90 per 1,000; Aden, 24·73 per 1,000; Ahmedabad, 20·62 per 1,000; and Mount Abo, 20·83 per 1,000. The lowest death rates are given by Belgaum and Ahmednagar, which are respectively 3·55 and 3·58 per 1,000.

The admissions and deaths in the various classes and orders of diseases are shown in Abstract No. XXXI., furnished by the Principal Medical Officer.

GENERAL DISEASES.—*Febrile Group.*—For the Presidency division the rate of admissions is 1,010 per 1,000 men, which is 105 higher than that for last year. For the Poona Division the rate is 1,220 per 1,000, or 386 higher. For the Mhow Division it is 1,778, or 674 higher, and for the Depôts it is 1,570, or 971 higher. The death rate for the Presidency Division is 3·20 per 1,000 men, which is ·87 per 1,000 men lower than for last year, that for Poona is 1·96 per 1,000, or 2·81 lower, that for Mhow is 5·96 per 1,000, or 12·01 lower, and that for the Depôts is 3·73, or 10·42 lower. *Constitutional Group.*—For the Presidency Division the rate of admissions is 167 per 1,000 men, or 66 higher than for last year; for the Poona Division it is 237 per 1,000, or 14 higher; for the Mhow Division it is 151 per 1,000, or 12 higher, and for the Depôts it is 287 per 1,000, or 42 higher. The death rate for the Presidency Division is 2·14 per 1,000 men, or 1·5 higher than for last year; that for the Poona Division is ·98 or ·61 lower than last year; that for Mhow is ·85, and the rate for the Depôts is 3·73 per 1,000 men. There was no death in the preceding year in the two last named.

Eruptive Fevers.—There were but 3 admissions which took place in the Presidency and Poona Divisions.

Continued Fevers.—For the Presidency Division the rate of admissions is 124 per 1,000 of the strength, or 67 lower than for last year. For the Poona Division the rate is 167 per 1,000, or 117 higher. For the Mhow Division the

rate is 52, or 126 lower, and for the Depôts it is 130 or 83 higher. The death rate for the Presidency Division is 1·34 per 1,000 or 1·10 lower than that for last year. For the Poona Division it is ·65, or ·30 lower. For the Mhow Division it is 3·83, or ·56 lower, and for the Depôts it is 3·73, or 5·70 lower. *Enteric Fever.*—The relation of enteric fever to locality, and to season in the present year is shown in Abstract No. XXXII. taken from the report of the Principal Medical Officer. From this Table it will be observed that although there is not such a marked inequality in the prevalence of cases through the several months of the year, as occurred in the previous year, during which nearly four fifths of the cases occurred in its latter half, still, out of the total number of 28 cases, 16 occurred between August and December, the greatest number in any month being 6 in November; 12 between January and May, of which 4 were in March and 4 in May; none in June or July. Of the 17 deaths, 10 occurred between August and December, 6 between January and May, and 1 in June. Out of 24 stations (Sukkur included) 14, the same number as in the year 1878, contributed cases of enteric fever, and with the exception of 5, they were the same cantonments in which the fever prevailed in the previous year. Nasirabad furnished the largest number of cases by 8, or little less than one-third of the total number of admissions. Next in frequency stands Deesa with only 3, while in the previous year there were 12 cases. The prevalence of the fever in the other stations named in the table was confined to one or two cases only.

Paroxysmal Fevers.—The rate of admissions for these fevers is higher for all the divisions than in the preceding year, but especially for Mhow and the Depôts where they are respectively nearly doubled and trebled.

The proportional prevalence of paroxysmal fevers at the several stations in the Command in the present and in the preceding year are shown in the following Table, taken from the report of the Principal Medical Officer :—

Stations.	Ratio of Admissions per 1,000 of the Strength.		Stations.	Ratio of Admissions per 1,000 of the Strength.	
	1879.	1878.		1879.	1878.
Asirgarh -	1457·7	2187·5	Teethul -	—	583·3
Bombay -	601·8	1842·8	Deolali -	1281·0	492·2
Ahmedabad -	984·5	1600·0	Poona -	1202·3	491·8
Kirkee -	1248·5	1534·7	Deesa -	334·9	488·2
Neemuch -	3207·8	1050·1	Kurrachi -	1664·4	423·4
Belgaum -	578·7	1047·5	Aboo -	1437·5	409·1
Nasirabad -	1327·2	929·9	On March -	179·4	338·7
Taraghar -	1973·7	904·8	Ghisri -	—	258·1
Mhow -	1451·6	858·6	Khandalla -	631·6	242·4
Hyderabad -	1201·0	810·3	Ahmednagar -	1207·8	222·6
Satara -	1479·7	664·6	Aden -	83·6	166·5
Baroda -	2078·2	622·3	Indore -	1532·5	115·9
Purandhar -	1253·9	598·1			

From this table it will be observed that out of 23 stations, 15 show higher rates of admissions for malarious fevers than in the preceding year, and that Neemuch and Baroda, which are respectively 3207· and 2078· per 1,000, are the highest, while Asirgarh and Bombay, which were the highest last year, show much lower rates in the present.

Cholera.—There were two admissions and one death in the Presidency Division, and one death is shown in the Poona Division. No other cases occurred. In the preceding year 6 cases occurred in the Presidency Division, 10 in the Poona, 36 in the Mhow, and 5 amongst the troops on the march.

Rheumatism.—There is no marked difference in the rates of admission for the different Divisions when compared with last year. Higher rates are given for the Presidency, and for the Depôts, but lower for Poona and Mhow.

Syphilis.—Higher rates are given for all the Divisions and for the Depôts than in the preceding year. The highest rates are for Poona and the Depôts, which are respectively 184 and 186 per 1,000.

Bombay.

Tubercular Diseases.—The rates of admissions are higher for all the Divisions, but lower for the Depôts, than in the preceding year. Of 10 deaths in the Command, 7 occurred in the Presidency Division, 2 in the Poona, and 1 at the Depôts, there was no death in the Mhow Division.

LOCAL DISEASES.—*Diseases of the Nervous System.*—Compared with the preceding year the rates of admission show very little change; those for the Presidency and Poona Divisions are a little lower, while those for the Mhow Division and the Depôts are higher. The death rates are lower for all the Divisions than in the preceding year. There was no death at the Depôts in either year.

Diseases of the Eye.—Lower rates of admission are given in all the Divisions than for last year. For the Depôts there is also a decrease.

Diseases of the Circulatory System.—Slightly lower rates are given for the Presidency Division and the Depôts than last year. For the Poona and Mhow Divisions they are a little higher. The death rates are higher by a small fraction for each of the Divisions. For the Depôts the rate is 4·72 per 1,000 lower.

Diseases of the Respiratory System.—Compared with the preceding year, the rates of admissions are considerably higher for all the Divisions, and for the Depôts and troops on the march. The rate of mortality is also higher in all, and in some very considerably. In the Presidency Division it is 3·20 per 1,000 higher. In the Poona it is ·33 higher. In the Mhow it is 1·28 higher. For the troops on the march it is 16·75 higher, and for the Depôts it is 7·46 higher.

Diseases of the Digestive System.—Compared with 1878, there is a considerable decrease in the rate of admissions in all the Divisions and in the Depôts. The death rates are lower for all Divisions, but lowest for Poona and Mhow, where they are respectively 2·20 and 2·11 lower. The rate for the Depôts is 4·51 higher than last year.

Diseases of the Urinary System.—The rates of admissions are higher than in the preceding year for the Presidency and Poona Divisions, and lower for Mhow and the Depôts.

CONDITIONS.—*Debility.*—The rates of admissions are a little lower for all the Divisions except Poona, and considerably lower for the Depôts than last year.

POISONS.—The rates of admissions do not differ materially from last year's. They are lower for the Mhow Division, and higher for the Presidency and Poona Divisions and the Depôts.

INJURIES.—The rate of admissions is lower for the Presidency Division by 12·86 per 1,000 than last year. For the Poona Division it is lower by 6·18. For the Mhow Division it is lower by 6·53, and for the Depôts it is higher by 48·29.

In Abstract No. XXXIII., which is taken from the report of the Principal Medical Officer, are shown the strength, the number of admissions and deaths, and the invaliding in each corps and arm of the service, and the ratios under each heading per 1,000 of the strength during the year. In comparing this table with that furnished last year, it will be observed that the amounts of sickness and of invaliding are greater in the year under report, while the mortality is considerably less. The cavalry shows the least sickness, mortality, and invaliding, all of which are lower than in 1878. In the artillery and infantry the rates of sickness and of invaliding are higher than for last year, while the rate of mortality is lower.

Abstract No. XXXIV., which is taken from the report of the Principal Medical Officer, shows the comparative mortality and invaliding in the three grades of commissioned officers, non-commissioned officers, and privates during the year under report. From this table it will be observed that during 1879, the mortality rate is for the officers 8·04, for the non-commissioned officers 16·38, and for the privates 15·99 per 1,000 of the strength, which is lower for all ranks than that for last year, and for the officers and non-commissioned officers, than the average of the previous 10 years, while for the privates it remains unchanged. As in previous years the death rate is highest for the non-commissioned officers, which may be accounted for by the fact that their average ages are considerably greater than those of the privates, while the low rate for the officers is probably chiefly due to the greater facility afforded them for leaving

the country as invalids before succumbing to malarial or other illnesses. This theory is supported by the fact that, while the invaliding rate for officers for the last 10 years has averaged 90·35 per 1,000, that for the non-commissioned officers and men has only been 41·68 and 40·18 respectively, but in the year under report it happens for the first time that the rates of invaliding for the non-commissioned officers and men are higher than those for the officers.

Officers.

In an average annual strength of 354 officers, serving in the Command, there were 279 admissions, 3 deaths, and 20 were invalided to England, being in the ratios respectively of 788, of 8·47, and of 56·49 per 1,000 of the strength which when compared with last year gives a lower rate for the admissions by 149, a higher for the deaths by 23, and a lower for the invaliding by 64·39 per 1,000 of the strength. Fevers and diseases of the digestive system were the principal causes of the admissions. Paroxysmal fevers contributing exactly one-third of the whole. The deaths were due to enteric fever, apoplexy, and abscess of the liver. The principal causes of invaliding were general debility and ague.

Women.

The average annual strength of the wives of the non-commissioned officers and men was 797, the number of admissions into hospital (excluding cases of child-birth) was 914, and there were 21 deaths, being in the ratios respectively of 1,147, and 26·35 per 1,000 of the strength, which, when compared with the rates for the preceding year gives an increase of 65 per 1,000 for the admissions, and of 5·05 for the deaths. As in 1878 fevers, general debility, dysentery, and diarrhoea were the chief causes of the admissions. Fevers, dysentery, and general debility were the chief causes of mortality.

Children.

The average annual strength of the children of the non-commissioned officers and private soldiers was 1,548, the admissions into hospital were 1,240, and the deaths amounted to 104. The ratios given by these numbers are for the admissions 801·03, and for the deaths 67·18 per 1,000 of the strength, which when compared with the rates for last year gives a decrease of 28·43 per 1,000 for the admissions, and of 20·51 for the deaths. Fevers, especially ague, general debility, diseases of the eye, diseases of the respiratory system, and teething were the chief causes of the admissions; the deaths were caused chiefly by convulsions 18, general debility 18, teething 13, malarious fevers 12, diarrhoea 11, &c.

Invaliding.

Five hundred and ninety-six non-commissioned officers and men were sent home as invalids from the Command during the year, being in the ratio of 60·19 per 1,000 of the strength, which is 1·70 per 1,000 higher than the rate for last year. Of these, 85 were sent to England on account of diseases of the febrile group, 98 for those of the constitutional group, 186 for local diseases, 213 for debility, and 4 for local injuries; 205 invalids were finally discharged the service.

Mean Daily Sick.

The average number of constantly sick was 757·69, being in the ratio of 76·53 per 1,000 of the strength; the average sick time to each soldier was 27·93 days, and the average duration of each case of sickness was 13·09 days. Compared with the preceding year, the ratio per 1,000 constantly sick is 12·07 higher; the average sick time to each soldier is 4·40 days longer, and the average duration of each case is ·06 day longer.

XIII.—ON THE HEALTH OF THE TROOPS ON BOARD SHIP.

STATISTICAL REPORT.

*Troops on
Board Ship.*

The troops embarked during the year, as shown in the returns received in the Army Medical Department, were:—

I. Corps, and drafts for corps, proceeding on service abroad	-	25,880
II. Corps returning from abroad	-	11,579
III. Corps or detachments, passing by sea from one Command to another	-	6,894
IV. Invalids returning to England	-	4,377

1.—TROOPS PROCEEDING ON FOREIGN SERVICE.

During the year 25,880 non-commissioned officers and men, giving an average annual strength of 2,326, embarked for foreign service. In this force there were 1,768 admissions into hospital and 10 deaths; the admission rate, per 1,000 of the average annual strength, is therefore 760, or 234·1 higher than that for last year, and the death rate is 4·30, or 1·26 higher.

The classes and orders of diseases by which the admissions and deaths were caused are shown in Abstract No. XXXV.

GENERAL DISEASES.—63 admissions are shown in the *febrile group*, giving a ratio of 27·1 per 1,000 of the strength, which is 7·1 lower than the rate for last year. Scarlet fever caused one admission which occurred in the “Himalaya” on her passage from Portsmouth to Malta. Of simple continued fever there were 24 cases, of febricula 23, of ague 4, of remittent fever 1, erysipelas caused 8 admissions, and 2 cases of simple cholera occurred on board the ship “Clyde” on her passage from England to Natal. There was no death in this group. For the *Constitutional Group*, there were 371 admissions, giving a ratio of 159·5 per 1,000, which is 68·9 higher than that for last year, and is due in a great degree to an increased prevalence of syphilis. Of the admissions 258 were for primary and 37 for secondary syphilis, 54 for rheumatism of various forms, 12 for phthisis pulmonalis, and tubercular hæmoptysis, &c. There was one death which was due to phthisis pulmonalis.

LOCAL DISEASES.—Compared with last year the rate of admissions is higher for all groups in this class, except for *diseases of the circulatory and cutaneous systems*, and that for the *organs of locomotion*, which is the same in both years. The largest increase is observed in diseases of the *digestive and urinary systems*, where the rates are respectively 89·4 and 132·5 per 1,000, or 38·4, and 67·1 higher. The increase in diseases of the *digestive system* is due chiefly to a proportionately larger number of cases of tonsillitis (93). That in those of the *urinary system* to a higher rate of prevalence of gonorrhœa, 269 cases having been admitted. There were 7 deaths in the class, 5 of which came under diseases of the *respiratory*, and 2 under diseases of the *nervous system*, and were caused by apoplexy (1), sunstroke (1), pneumonia (4), pleurisy (1).

CONDITIONS, &c.—*Debility.*—There were 26 admissions under this heading giving a ratio of 11·2 per 1,000 of the strength, which is 5·9 higher than that for last year.

POISONS.—There was but one admission which was for delirium tremens, and terminated fatally.

INJURIES.—One admission and one death are shown under the heading of *general injuries*, it was a case of asphyxia by drowning in a man of the Royal Engineers, on his passage from Portsmouth to Natal in the ship “Palmyra;” 167 admissions are shown under the heading of *local injuries*, giving a rate of 71·8,

which is 20 per 1,000 higher than that for last year. The were all accidental. *Troops on Board Ship.* Contusions caused 60 of the admissions, wounds 40, burns and scalds 22, sprains 22, fractures 11, &c. There was no death from *local injury*.

II.—TROOPS RETURNING HOME FROM ABROAD.

The number of effective non-commissioned officers and men that embarked for England from stations abroad was 11,579, giving an average annual strength of 1,181. Among these there were 696 admissions into hospital and 21 deaths, being in the ratios respectively of 589·3 and of 17·78 per 1,000 of the average strength. The admission rate is 5·8 and the death rate 2·30 higher than last year's.

The admissions and deaths in the various classes and orders of diseases are shown in Abstract No. XXXV.

GENERAL DISEASES.—278 admissions are shown in the *febrile group*, giving a ratio of 235·4 per 1,000 of the average strength, which is 45·0 higher than that for the preceding year. Ague, which was the principal cause of the increased rate, furnished 207 of the admissions, and nearly all occurred among men coming home from India. Enteric fever caused 18 admissions, and 3 deaths, all the cases except one, occurring among troops on their passage home from the Cape of Good Hope. Two deaths occurred from remittent fever, and one from ague. *Constitutional diseases* gave 86 admissions, or a rate of 72·8 per 1,000, which is 30·9 lower than that for last year; 48 of the admissions were for primary and 8 for secondary syphilis, 20 for various forms of rheumatism, 7 for phthisis pulmonalis and tubercular hæmoptysis, &c. There was one death which was caused by phthisis pulmonalis.

LOCAL DISEASES.—Compared with the preceding year higher rates are observed for diseases of the *nervous, circulatory, digestive, and cutaneous systems*, and for those of the ear, the *organs of locomotion, and cellular tissue*, and lower for diseases of the *absorbent, respiratory, and urinary systems*, and those of the eye. The greatest increase is noticeable in diseases of the *digestive system*, where the rate is 28·7 higher; the greatest decrease is observed in diseases of the *urinary system*, where it is 20·1 lower. Dysentery and diarrhoea were the chief causes of the increase in diseases of the *digestive system*; the decrease in diseases of the *urinary system* was due to a proportionately less prevalence of gonorrhoea; 12 deaths are returned in the class, 3 of which were under diseases of the *nervous system*, and were due to sun-stroke (2), apoplexy (1); 2 occurred under diseases of the *circulatory system*, and were due to valvular disease of the heart; 4 were from diseases of the *respiratory system*, and were caused by pneumonia (2), bronchitis (2); and 3 were under diseases of the *digestive system* and were due to dysentery (2), diarrhoea (1).

CONDITIONS, &c.—*Debility.*—12 admissions are shown under this heading, giving a ratio of 10·1 per 1,000, which is 19·3 lower than the rate for last year.

INJURIES.—1 admission and 1 death is shown as multiple injury, in a man of the 15th Hussars, who fell under the ship's wheel while the vessel was bearing up against a violent gale; 44 cases of *local injury* are returned with one death which was due to concussion of the brain. All except 2 were accidental, 1 case is shown as homicidal, and 1 as *self-inflicted injury*. The rate of admissions is 17·1 per 1,000 higher than last year, the death rate is 7·58 lower.

III.—TROOPS PROCEEDING FROM ONE STATION ABROAD TO ANOTHER.

White Troops.

The number of non-commissioned officers and men proceeding from one station abroad to another was 6,894, giving an annual average of 616. In this force there were 264 admissions into hospital, and 4 deaths, being in the ratios respectively of 428·6 and of 6·48 per 1,000 of the average strength. The admission rate is lower by 1,451 than that for last year, and the death rate is 8·12 lower.

*Troops on
Board Ship.*

The classes and orders of the diseases to which the admissions and deaths were due are shown in Abstract No. XXXV.

GENERAL DISEASES.—*Febrile Group.*—In this group there were 23 admissions being in the ratio of 37·3 per 1,000 of the strength, which, when compared with the previous year, shows the enormous decrease of 1156·1 per 1,000 of the strength, the high rate in the previous year having been due to the large number of cases of paroxysmal fevers occurring in the troops proceeding from Cyprus to India, Malta, Gibraltar, and Halifax, while in the year under report there was no apparent cause for the disturbance of the ordinary average, although it is very much lower than that for the previous 10 years; 19 of the admissions were for simple continued fever, 2 for febricula, and 2 for ague. There was no death.

Constitutional Group.—The total number returned for diseases of this group is 60, giving a ratio of 97·4 per 1,000 of the strength, which is 9·8 higher than that for last year, 41 cases of primary and 1 of secondary syphilis are shown, 14 of rheumatism, 2 of phthisis pulmonalis, 1 of tubercular hæmoptysis, and 1 of cancer. There was one death from acute rheumatism affecting the heart.

LOCAL DISEASES.—Compared with the preceding year the admission rates for diseases of the *respiratory and cutaneous systems* are higher, while those for the other groups are lower.

CONDITIONS, &c.—*Debility* gave no admission; in the previous year there was a large number. The immunity this year is due no doubt to the comparative absence of fevers and the more healthy condition generally of the troops on embarkation.

IV.—INVALIDS RETURNING TO ENGLAND.

The number of invalids embarked for England was 4,377. There were 37 deaths among them while at sea; these are accounted for, as in former years, in the tables showing the sickness and mortality of the commands from which they were invalided.

ABSTRACTS I. TO XXXVIII.

ABSTRACT No. 1.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into serving in the UNITED KINGDOM during the Year 1879, with the Ratios

Orders.	Average Strength in Annual Returns, 80,700.		Admissions into Hospital.	Died.			Invalids Discharged the Service.	Average Number constantly Sick.
	†Average Strength, including Men detached, 84,380.			With the Regiment.	Absent from the Regiment.	Total.		
	Diseases.							
I.—General Diseases.								
Febrile Group.								
	Eruptive Fevers	-	395	3	—	3	—	20·78
	Continued „	-	1,285	19	5	24	—	48·19
	Yellow Fever	-	—	—	—	—	—	—
	Paroxysmal Fevers	-	1,391	—	—	—	4	49·70
	Cholera	-	—	—	—	—	—	—
	Other diseases	-	955	6	—	6	—	26·83
	Total	-	4,026	28	5	33	4	145·50
Constitutional Group.								
	Rheumatism	-	3,279	9	1	10	187	189·92
	Primary Syphilis	-	5,113	—	—	—	—	385·14
	Secondary „	-	2,341	3	—	3	58	169·32
	Tubercular Diseases	-	900	200	35	235	376	110·83
	Scurvy and Purpura	-	19	—	—	—	—	1·34
	Other diseases	-	128	4	3	7	13	17·67
	Total	-	11,780	216	39	255	584	873·72
II.—Local Diseases.								
Diseases of the—								
1	Nervous System	-	955	30	8	38	233	79·71
2	Eye	-	1,128	—	—	—	67	61·80
3	Ear	-	442	—	—	—	51	27·32
4	Nose	-	42	—	—	—	2	1·44
5	Circulatory System	-	1,056	52	2	54	389	91·75
6	Absorbent „	-	1,219	—	—	—	5	108·48
7	Ductless Glands	-	6	—	—	—	—	·21
8	Respiratory System	-	7,818	122	15	137	139	377·33
9	Digestive „	-	8,257	27	9	36	194	273·52
10	Urinary { Gonorrhœa	-	6,157	—	—	—	—	309·78
	System { Sequelæ of Gonorr.	-	874	1	—	1	14	59·65
	Other diseases	-	820	15	1	16	33	46·24
11	Generative System	-	899	—	—	—	16	48·37
12	Organs of Locomotion	-	467	3	1	4	105	37·76
13	Cellular Tissue	-	1,806	4	—	4	8	82·20
14	Cutaneous System	-	8,960	—	—	—	30	332·70
	III.—Debility	-	945	—	—	—	258	74·50
	IV.—Poisons	-	147	9	—	9	—	3·97
V.—Injuries.								
1	General	-	10	28	4	32	—	4·00
2	Local	-	8,275	18	3	21	82	342·45
3	In action	-	—	—	—	—	—	—
	No appreciable disease	-	258	—	—	—	—	10·29
	Cause unknown (refers to deaths only).	-	—	—	2	2	—	—
	General total	-	66,347	553	84	637	2,214	3392·69

* The average ratios for 10 years will be given in future years. The ratios for the year 1879 will be given
† Ratios of deaths and invalids calculated on this strength.

HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the TROOPS per 1,000 of the Strength and the Average Ratios for 10 Years.*

Ratio per 1,000.				*Average Ratio per 1,000, from 1879 to 18			
Admis- sions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.	Admis- sions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.
4.9	.04	—	.26	—	—	—	—
15.9	.28	—	.60	—	—	—	—
—	—	—	—	—	—	—	—
17.2	—	.05	.61	—	—	—	—
—	—	—	—	—	—	—	—
11.8	.07	—	.33	—	—	—	—
49.8	.39	.05	1.80	—	—	—	—
40.6	.12	1.62	2.35	—	—	—	—
63.4	—	—	4.77	—	—	—	—
29.0	.04	.69	2.10	—	—	—	—
11.2	2.78	4.46	1.37	—	—	—	—
.2	—	—	.01	—	—	—	—
1.6	.08	.15	.22	—	—	—	—
146.0	8.02	6.92	10.82	—	—	—	—
11.8	.39	2.76	.99	—	—	—	—
14.0	—	.79	.76	—	—	—	—
5.5	—	.60	.34	—	—	—	—
.5	—	.02	.02	—	—	—	—
13.1	.64	4.61	1.14	—	—	—	—
15.1	—	.06	1.34	—	—	—	—
.1	—	—	—	—	—	—	—
96.9	1.62	1.65	4.68	—	—	—	—
102.3	.43	2.30	3.39	—	—	—	—
76.3	—	—	3.84	—	—	—	—
10.8	.01	.17	.74	—	—	—	—
10.2	.19	.39	.57	—	—	—	—
11.2	—	.19	.60	—	—	—	—
5.8	.05	1.24	.47	—	—	—	—
22.4	.05	.09	1.02	—	—	—	—
111.0	—	.86	4.12	—	—	—	—
11.7	—	3.06	.92	—	—	—	—
1.8	.12	—	.05	—	—	—	—
.1	.38	—	.05	—	—	—	—
102.5	.24	.97	4.24	—	—	—	—
—	—	—	—	—	—	—	—
3.2	—	—	.13	—	—	—	—
—	.02	—	—	—	—	—	—
822.1	7.55	26.23	42.03	—	—	—	—

in the Report for 1880, those for 1879 to 1880 in that for 1881, those for 1879 to 1881 in that for 1882, &c., &c.

ABSTRACT A.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into HOSPITAL, the NORTHERN DISTRICT during the Year 1879, with the Ratios

Orders.	Average Strength, 7,993.			Admis- sions into Hospital.	Deaths.	Invalids Discharged the Service.	Average Number constantly Sick.
	Diseases.						
	I.—General Diseases.						
	Febrile Group.						
	Eruptive Fevers	-	-	20	—	—	1·09
	Continued "	-	-	107	1	—	2·19
	Yellow Fever	-	-	—	—	—	—
	Paroxysmal Fevers	-	-	87	—	—	2·06
	Cholera	-	-	—	—	—	—
	Other diseases	-	-	52	—	—	1·47
	Total	-	-	266	1	—	6·81
	Constitutional Group.						
	Rheumatism	-	-	302	2	7	16·87
	Primary Syphilis	-	-	670	—	—	49·11
	Secondary "	-	-	305	—	6	20·75
	Tubercular Diseases	-	-	114	27	30	12·03
	Scurvy and Purpura	-	-	—	—	—	—
	Other diseases	-	-	10	—	3	3·53
	Total	-	-	1,401	29	46	102·29
	II.—Local Diseases.						
	Diseases of the—						
1	Nervous System	-	-	116	4	25	9·21
2	Eye	-	-	108	—	8	4·93
3	Ear	-	-	32	—	2	1·31
4	Nose	-	-	5	—	—	·09
5	Circulatory System	-	-	111	8	46	7·32
6	Absorbent "	-	-	130	—	2	10·63
7	Ductless Glands	-	-	—	—	—	—
8	Respiratory System	-	-	822	19	14	34·32
9	Digestive "	-	-	764	4	22	21·66
10	Urinary { Gonorrhœa	-	-	743	—	—	30·92
	System { Sequelæ of Gonorrhœa	-	-	150	—	—	8·15
	Other diseases	-	-	67	5	4	3·78
11	Generative System	-	-	97	—	3	5·05
12	Organs of Locomotion	-	-	43	2	12	3·87
13	Cellular Tissue	-	-	197	1	2	8·81
14	Cutaneous System	-	-	934	—	7	28·82
	III.—Debility			90	—	20	5·31
	IV.—Poisons			16	1	—	·39
	V.—Injuries.						
1	General	-	-	3	4	—	·14
2	Local	-	-	927	3	14	37·64
3	In action	-	-	—	—	—	—
	No appreciable disease	-	-	11	—	—	·25
	Cause unknown (refers to deaths only)	-	-	—	—	—	—
	General total	-	-	7,033	81	227	331·70

* The average ratios for 10 years will be given in future years. The ratios for the year 1879 will be given

DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the TROOPS stationed in per 1,000 of the Strength and the Average Ratios for 10 Years.*

Ratio per 1,000.				*Average Ratio per 1,000, from 1879 to 18			
Admissions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.	Admissions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.
2.5	—	—	.14	—	—	—	—
13.4	.12	—	.27	—	—	—	—
—	—	—	—	—	—	—	—
10.9	—	—	.26	—	—	—	—
—	—	—	—	—	—	—	—
6.5	—	—	.18	—	—	—	—
33.3	.12	—	.85	—	—	—	—
37.8	.25	.88	2.11	—	—	—	—
83.8	—	—	6.14	—	—	—	—
38.2	—	.75	2.60	—	—	—	—
14.2	3.38	3.75	1.51	—	—	—	—
—	—	—	—	—	—	—	—
1.2	—	.38	.44	—	—	—	—
175.2	3.63	5.76	12.80	—	—	—	—
14.5	.50	3.12	1.15	—	—	—	—
13.5	—	1.00	.62	—	—	—	—
4.0	—	.25	.16	—	—	—	—
.6	—	—	.01	—	—	—	—
13.9	1.00	5.76	.92	—	—	—	—
16.3	—	.25	1.33	—	—	—	—
—	—	—	—	—	—	—	—
102.8	2.38	1.75	4.29	—	—	—	—
95.6	.50	2.75	2.71	—	—	—	—
93.0	—	—	3.87	—	—	—	—
18.8	—	—	1.02	—	—	—	—
8.4	.63	.50	.47	—	—	—	—
12.1	—	.38	.63	—	—	—	—
5.4	.25	1.50	.49	—	—	—	—
24.6	.12	.25	1.10	—	—	—	—
116.8	—	.88	3.61	—	—	—	—
11.3	—	2.50	.66	—	—	—	—
2.0	.12	—	.05	—	—	—	—
.4	.50	—	.02	—	—	—	—
116.0	.38	1.75	4.71	—	—	—	—
—	—	—	—	—	—	—	—
1.4	—	—	.03	—	—	—	—
—	—	—	—	—	—	—	—
879.9	10.13	28.40	41.50	—	—	—	—

In the Report for 1880, those for 1879 to 1880 in that for 1881, those for 1879 to 1881 in that for 1882, &c., &c.

ABSTRACT B.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into HOSPITAL, the EASTERN DISTRICT during the Year 1879, with the Ratios

Orders.	Average Strength, 3,879.			Admis- sions into Hospital.	Deaths.	Invalids Discharged the Service.	Average Number constantly Sick.
	Diseases.						
	I.—General Diseases.						
	Febrile Group.						
	Eruptive Fevers	-	-	7	—	—	·52
	Continued „	-	-	84	—	—	·73
	Yellow Fever -	-	-	—	—	—	—
	Paroxysmal Fevers	-	-	122	—	1	2·40
	Cholera	-	-	—	—	—	—
	Other diseases	-	-	18	—	—	2·79
	Total	-	-	231	—	1	6·44
	Constitutional Group.						
	Rheumatism	-	-	187	—	6	8·88
	Primary Syphilis	-	-	220	—	—	17·49
	Secondary „	-	-	110	—	1	9·54
	Tubercular Diseases	-	-	55	15	26	3·16
	Scurvy and Purpura	-	-	1	—	—	·11
	Other diseases	-	-	7	1	—	3·82
	Total	-	-	580	16	33	43·00
	II.—Local Diseases.						
	Diseases of the—						
1	Nervous System	-	-	45	4	13	4·38
2	Eye	-	-	58	—	3	3·12
3	Ear	-	-	10	—	2	1·04
4	Nose	-	-	5	—	—	·07
5	Circulatory System	-	-	41	3	12	3·80
6	Absorbent „	-	-	63	—	1	5·06
7	Ductless Glands	-	-	—	—	—	—
8	Respiratory System	-	-	492	9	5	24·71
9	Digestive „	-	-	443	1	11	15·55
10	Urinary { Gonorrhœa	-	-	214	—	—	7·82
	System { Sequelæ of Gonorrhœa	-	-	59	1	—	2·99
	Other diseases	-	-	29	2	1	6·81
11	Generative System	-	-	66	—	—	5·90
12	Organs of Locomotion	-	-	10	—	1	2·15
13	Cellular Tissue	-	-	98	1	—	8·32
14	Cutaneous System	-	-	310	—	2	9·27
	III.—Debility	-	-	82	—	13	3·20
	II.—Poisons	-	-	38	—	—	·71
	V.—Injuries.						
1	General	-	-	—	2	—	—
2	Local	-	-	358	1	3	14·26
3	In action	-	-	—	—	—	—
	No appreciable disease	-	-	6	—	—	·19
	Cause unknown (refers to deaths only)	-	-	—	—	—	—
	General total	-	-	3,188	40	101	168·79

* The average ratios for 10 years will be given in future years. The ratios for the year 1879 will be given

DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the TROOPS stationed in per 1,000 of the Strength and the Average Ratios for 10 Years.*

Ratio per 1,000.				*Average Ratio per 1,000, from 1879 to 18			
Admis- sions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.	Admis- sions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.
1·8	—	—	·13	—	—	—	—
21·7	—	—	·19	—	—	—	—
—	—	—	—	—	—	—	—
31·4	—	·26	·62	—	—	—	—
—	—	—	—	—	—	—	—
4·6	—	—	·72	—	—	—	—
59·5	—	·26	1·66	—	—	—	—
48·2	—	1·54	2·29	—	—	—	—
56·7	—	—	4·51	—	—	—	—
28·3	—	·26	2·46	—	—	—	—
14·2	3·86	6·70	·82	—	—	—	—
·3	—	—	·03	—	—	—	—
1·8	·26	—	·98	—	—	—	—
149·5	4·12	8·50	11·09	—	—	—	—
11·6	1·03	3·35	1·13	—	—	—	—
15·0	—	·77	·80	—	—	—	—
2·6	—	·52	·27	—	—	—	—
1·3	—	—	·02	—	—	—	—
10·6	·77	3·09	·98	—	—	—	—
16·2	—	·26	1·30	—	—	—	—
—	—	—	—	—	—	—	—
126·8	2·32	1·29	6·37	—	—	—	—
114·2	·26	2·84	4·01	—	—	—	—
55·2	—	—	2·02	—	—	—	—
15·2	·26	—	·77	—	—	—	—
7·5	·52	·26	1·76	—	—	—	—
17·0	—	—	1·52	—	—	—	—
2·6	—	·26	·55	—	—	—	—
25·3	·26	—	2·14	—	—	—	—
79·9	—	·52	2·39	—	—	—	—
8·2	—	3·35	·82	—	—	—	—
9·8	—	—	·18	—	—	—	—
—	·52	—	—	—	—	—	—
92·3	·26	·77	3·68	—	—	—	—
—	—	—	—	—	—	—	—
1·5	—	—	·05	—	—	—	—
—	—	—	—	—	—	—	—
821·8	10·31	26·04	43·51	—	—	—	—

in the Report for 1880, those for 1879 to 1880 in that for 1881, those for 1879 to 1881 in that for 1882, &c., &c.

ABSTRACT C.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into HOSPITAL, the WESTERN DISTRICT during the Year 1879, with the Ratios

Orders.	Average Strength, 4,853.			Admis- sions into Hospital.	Deaths.	Invalids Discharged the Service.	Average Number constantly Sick.
	Diseases.						
	I.—General Diseases.						
	Febrile Group.						
	Eruptive Fevers	-	-	27	—	—	·92
	Continued "	-	-	75	4	—	3·64
	Yellow Fever	-	-	—	—	—	—
	Paroxysmal Fevers	-	-	60	—	—	2·67
	Cholera	-	-	—	—	—	—
	Other diseases	-	-	15	—	—	·85
	Total	-	-	177	4	—	7·58
	Constitutional Group.						
	Rheumatism	-	-	186	—	7	13·20
	Primary Syphilis	-	-	179	—	—	14·48
	Secondary "	-	-	100	1	2	7·44
	Tubercular Diseases	-	-	52	12	20	7·96
	Scurvy and Purpura	-	-	—	—	—	—
	Other diseases	-	-	4	—	1	·30
	Total	-	-	521	13	30	48·33
	II.—Local Diseases.						
	Diseases of the—						
1	Nervous System	-	-	65	1	14	4·64
2	Eye	-	-	55	—	1	5·48
3	Ear	-	-	22	—	1	·82
4	Nose	-	-	4	—	—	·38
9	Circulatory System	-	-	51	3	15	4·58
6	Absorbent "	-	-	57	—	—	2·85
7	Ductless Glands	-	-	—	—	—	—
8	Respiratory System	-	-	350	9	6	17·07
9	Digestive "	-	-	483	1	17	17·72
10	Urinary { Gonorrhœa	-	-	390	—	—	21·00
	System { Sequelæ of Gonorrhœa	-	-	44	—	1	3·05
	Other diseases	-	-	54	—	1	2·96
11	Generative System	-	-	53	—	1	3·19
12	Organs of Locomotion	-	-	32	—	7	1·95
13	Cellular Tissue	-	-	79	—	—	5·53
14	Cutaneous System	-	-	490	—	1	19·24
	III.—Debility	-	-	45	—	15	7·18
	IV.—Poisons	-	-	7	2	—	·28
	V.—Injuries.						
1	General	-	-	1	2	—	·68
2	Local	-	-	428	—	5	18·90
3	In action	-	-	—	—	—	—
	No appreciable disease	-	-	30	—	—	·80
	Cause unknown (refers to deaths only)	-	-	—	—	—	—
	General total	-	-	3,438	35	115	189·21

* The average ratios for 10 years will be given in future years. The ratios for the year 1879 will be given

DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the TROOPS stationed in per 1,000 of the Strength and the Average Ratios for 10 Years.*

Ratio per 1,000.				*Average Ratio per 1,000, from 1879 to 18			
Admis- sions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.	Admis- sions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.
5.6	—	—	.19	—	—	—	—
15.4	.82	—	.75	—	—	—	—
—	—	—	—	—	—	—	—
12.4	—	—	.55	—	—	—	—
—	—	—	—	—	—	—	—
3.1	—	—	.07	—	—	—	—
36.5	.82	—	1.56	—	—	—	—
38.3	—	1.44	2.72	—	—	—	—
36.9	—	—	2.97	—	—	—	—
20.6	.21	.41	1.53	—	—	—	—
10.7	2.47	4.12	1.64	—	—	—	—
—	—	—	—	—	—	—	—
.8	—	.21	.06	—	—	—	—
107.3	2.68	6.18	8.92	—	—	—	—
13.4	.21	2.88	.96	—	—	—	—
11.3	—	.21	1.13	—	—	—	—
4.5	—	.21	.17	—	—	—	—
.8	—	—	.08	—	—	—	—
10.5	.61	3.09	.94	—	—	—	—
11.8	—	—	.59	—	—	—	—
—	—	—	—	—	—	—	—
72.1	1.86	1.24	3.52	—	—	—	—
99.5	.21	3.50	3.65	—	—	—	—
80.4	—	—	4.33	—	—	—	—
9.1	—	.21	.63	—	—	—	—
11.1	—	.21	.61	—	—	—	—
10.9	—	.21	.66	—	—	—	—
6.6	—	1.44	.40	—	—	—	—
16.3	—	—	1.14	—	—	—	—
101.0	—	.21	3.96	—	—	—	—
9.3	—	3.09	1.48	—	—	—	—
1.4	.41	—	.06	—	—	—	—
.2	.41	—	.14	—	—	—	—
88.2	—	1.03	3.89	—	—	—	—
—	—	—	—	—	—	—	—
6.2	—	—	.16	—	—	—	—
—	—	—	—	—	—	—	—
708.4	7.21	23.71	38.98	—	—	—	—

in the Report for 1880, those for 1879 to 1880 in that for 1881, those for 1879 to 1881 in that for 1882, &c., &c.

ABSTRACT D.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into HOSPITAL, the SOUTHERN DISTRICT during the Year 1879, with the Ratios

Orders.	Average Strength, 7,453.				Admis- sions into Hospital.	Deaths.	Invalids Discharged the Service.	Average Number constantly Sick.
	Diseases.							
	I.—General Diseases.							
	<i>Febrile Group.</i>							
	Eruptive Fevers	-	-	-	29	—	—	2·00
	Continued „	-	-	-	88	1	—	3·71
	Yellow Fever	-	-	-	—	—	—	—
	Paroxysmal Fevers	-	-	-	313	—	—	13·85
	Cholera	-	-	-	—	—	—	—
	Other diseases	-	-	-	38	2	—	1·54
	Total	-	-	-	468	3	—	21·10
	<i>Constitutional Group.</i>							
	Rheumatism	-	-	-	412	1	24	28·08
	Primary Syphilis	-	-	-	230	—	—	17·08
	Secondary „	-	-	-	143	—	5	13·31
	Tubercular Diseases	-	-	-	84	23	38	16·71
	Scurvy and Purpura	-	-	-	5	—	—	·71
	Other diseases	-	-	-	21	—	3	3·54
	Total	-	-	-	895	24	70	79·43
	II.—Local Diseases.							
	<i>Diseases of the—</i>							
1	Nervous System	-	-	-	92	3	25	10·39
2	Eye	-	-	-	89	—	5	3·94
3	Ear	-	-	-	53	—	4	3·65
4	Nose	-	-	-	5	—	—	·10
5	Circulatory System	-	-	-	105	4	40	13·48
6	Absorbent „	-	-	-	92	—	—	9·21
7	Ductless Glands	-	-	-	—	—	—	—
8	Respiratory System	-	-	-	977	8	17	50·25
9	Digestive „	-	-	-	1,075	3	23	89·42
10	Urinary { Gonorrhœa	-	-	-	493	—	—	23·83
	System { Sequelæ of Gonorrhœa	-	-	-	74	—	1	8·29
	Other diseases	-	-	-	96	—	2	2·94
11	Generative System	-	-	-	71	—	—	3·79
12	Organs of Locomotion	-	-	-	40	—	5	4·15
13	Cellular Tissue	-	-	-	143	1	1	6·56
14	Cutaneous System	-	-	-	820	—	2	82·65
	III.—Debility				126	—	40	11·90
	IV.—Poisons				14	—	—	·42
	V.—Injuries.							
1	General	-	-	-	1	2	—	—
2	Local	-	-	-	862	3	9	37·15
3	In action	-	-	-	—	—	—	—
	No appreciable disease	-	-	-	42	—	—	2·67
	Cause unknown (refers to deaths only)	-	-	-	—	—	—	—
	General total	-	-	-	6,633	51	244	365·32

* The average ratios for 10 years will be given in future years. The ratios for the year 1879 will be given

DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the TROOPS stationed in per 1,000 of the Strength and the Average Ratios for 10 Years.*

Ratio per 1,000.				*Average Ratio per 1,000, from 1879 to 18			
Admissions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.	Admissions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.
3.9	—	—	.27	—	—	—	—
11.8	.13	—	.50	—	—	—	—
—	—	—	—	—	—	—	—
42.0	—	—	1.86	—	—	—	—
—	—	—	—	—	—	—	—
5.1	.27	—	.20	—	—	—	—
62.8	.40	—	2.83	—	—	—	—
55.8	.13	3.22	3.77	—	—	—	—
30.8	—	—	2.29	—	—	—	—
19.2	—	.67	1.79	—	—	—	—
11.3	3.09	5.10	2.24	—	—	—	—
.7	—	—	.10	—	—	—	—
2.8	—	.40	.47	—	—	—	—
120.1	3.22	9.39	10.66	—	—	—	—
12.4	.40	3.35	1.39	—	—	—	—
11.9	—	.67	.53	—	—	—	—
7.1	—	.54	.49	—	—	—	—
.7	—	—	.01	—	—	—	—
14.1	.54	5.37	1.81	—	—	—	—
12.4	—	—	1.23	—	—	—	—
—	—	—	—	—	—	—	—
131.1	1.08	2.28	6.74	—	—	—	—
144.2	.40	3.09	5.34	—	—	—	—
66.1	—	—	3.19	—	—	—	—
9.9	—	.13	1.11	—	—	—	—
12.9	—	.27	.39	—	—	—	—
9.5	—	—	.51	—	—	—	—
5.4	—	.67	.55	—	—	—	—
19.2	.13	.13	.88	—	—	—	—
110.0	—	.27	4.88	—	—	—	—
16.9	—	5.37	1.59	—	—	—	—
1.9	—	—	.05	—	—	—	—
.1	.27	—	—	—	—	—	—
115.7	.40	1.21	4.98	—	—	—	—
—	—	—	—	—	—	—	—
5.6	—	—	.36	—	—	—	—
—	—	—	—	—	—	—	—
890.0	6.84	32.74	49.02	—	—	—	—

in the Report for 1880, those for 1879 to 1880 in that for 1881, those for 1879 to 1881 in that for 1882, &c., &c.

ABSTRACT E.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into HOSPITAL, the CHATHAM DISTRICT during the Year 1879, with the Ratios

Orders.	Average Strength, 4,135.				Admissions into Hospital.	Deaths.	Invalids Discharged the Service.	Average Number, constantly Sick.
	Diseases.							
	I.—General Diseases.							
	Febrile Group.							
	Eruptive Fevers	-	-	-	5	—	—	·23
	Continued „	-	-	-	21	—	—	·79
	Yellow Fever	-	-	-	—	—	—	—
	Paroxysmal Fevers	-	-	-	45	—	—	1·49
	Cholera	-	-	-	—	—	—	—
	Other diseases	-	-	-	11	—	—	·38
	Total	-	-	-	82	—	—	2·89
	Constitutional Group.							
	Rheumatism	-	-	-	278	—	9	13·86
	Primary Syphilis	-	-	-	209	—	—	16·28
	Secondary „	-	-	-	104	—	6	7·31
	Tubercular Diseases	-	-	-	60	11	30	5·47
	Scurvy and Purpura	-	-	-	1	—	—	} ·05
	Other diseases	-	-	-	2	—	1	
	Total	-	-	-	654	11	46	42·97
	II. Local Diseases.							
	Diseases of the—							
1	Nervous System	-	-	-	42	—	16	4·87
2	Eye	-	-	-	63	—	2	3·22
3	Ear	-	-	-	46	—	8	3·48
4	Nose	-	-	-	2	—	—	·03
5	Circulatory System	-	-	-	98	3	37	7·41
6	Absorbent „	-	-	-	42	—	—	3·15
7	Ductless Glands	-	-	-	—	—	—	—
8	Respiratory System	-	-	-	463	5	7	22·78
9	Digestive „	-	-	-	486	—	8	17·62
10	Urinary System {	Gonorrhœa	-	-	326	—	—	16·26
		Sequelæ of Gonorrhœa	-	-	38	—	—	2·57
		Other diseases	-	-	86	—	1	4·76
11	Generative System	-	-	-	27	—	2	1·71
12	Organs of Locomotion	-	-	-	25	—	6	1·45
13	Cellular Tissue	-	-	-	68	—	—	2·05
14	Cutaneous System	-	-	-	496	—	—	17·47
	III.—Debility	-	-	-	145	—	37	11·07
	IV.—Poisons	-	-	-	5	—	—	·18
	V.—Injuries.							
1	General	-	-	-	—	2	—	—
2	Local	-	-	-	491	—	7	24·70
3	In action	-	-	-	—	—	—	—
	No appreciable disease	-	-	-	7	—	—	·07
	Cause unknown (refers to deaths only)	-	-	-	—	—	—	—
	General total	-	-	-	3,692	21	177	190·71

* The average ratios for 10 years will be given in future years. The ratios for the year 1879 will be given

DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the TROOPS stationed in per 1,000 of the Strength and the Average Ratios for 10 Years.*

Ratio per 1,000.				*Average Ratio per 1,000, from 1879 to 18			
Admis- sions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.	Admis- sions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.
1.2	—	—	.06	—	—	—	—
5.1	—	—	.19	—	—	—	—
—	—	—	—	—	—	—	—
10.9	—	—	.36	—	—	—	—
—	—	—	—	—	—	—	—
2.6	—	—	.09	—	—	—	—
19.8	—	—	.70	—	—	—	—
67.2	—	2.18	3.35	—	—	—	—
50.6	—	—	3.94	—	—	—	—
25.2	—	1.45	1.77	—	—	—	—
14.5	2.66	7.25	1.32	—	—	—	—
.2	—	—	.01	—	—	—	—
.5	—	.24	—	—	—	—	—
158.2	2.66	11.12	10.39	—	—	—	—
10.2	—	3.87	1.18	—	—	—	—
15.2	—	.48	.78	—	—	—	—
11.1	—	1.94	.84	—	—	—	—
.5	—	—	.01	—	—	—	—
23.7	.73	8.95	1.79	—	—	—	—
10.2	—	—	.76	—	—	—	—
—	—	—	—	—	—	—	—
112.0	1.21	1.69	5.51	—	—	—	—
117.5	—	1.94	4.26	—	—	—	—
78.8	—	—	3.93	—	—	—	—
9.2	—	—	.62	—	—	—	—
20.8	—	.24	1.15	—	—	—	—
6.5	—	.48	.41	—	—	—	—
6.0	—	1.45	.35	—	—	—	—
16.4	—	—	.50	—	—	—	—
120.0	—	—	4.23	—	—	—	—
35.1	—	8.95	2.68	—	—	—	—
1.2	—	—	.04	—	—	—	—
—	.48	—	—	—	—	—	—
118.7	—	1.69	5.97	—	—	—	—
—	—	—	—	—	—	—	—
1.7	—	—	.02	—	—	—	—
—	—	—	—	—	—	—	—
892.8	5.08	42.80	46.12	—	—	—	—

in the Report for 1880, those for 1879 to 1880 in that for 1881, those for 1879 to 1881 in that for 1882, &c., &c.

ABSTRACT F.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into HOSPITAL, the SOUTH-EASTERN DISTRICT during the Year 1879, with the Ratios

Orders.	Average Strength, 6,871.			Admis- sions into Hospital.	Deaths.	Invalids Discharged the Service.	Average Number constantly Sick.
	Diseases.						
	I.—General Diseases.						
	Febrile Group.						
	Eruptive Fevers	-	-	58	—	—	1·81
	Continued „	-	-	83	1	—	1·69
	Yellow Fever	-	-	—	—	—	—
	Paroxysmal Fevers	-	-	228	—	2	9·32
	Cholera	-	-	—	—	—	—
	Other diseases	-	-	34	1	—	1·69
	Total	-	-	403	2	2	13·91
	Constitutional Group.						
	Rheumatism	-	-	242	1	18	15·06
	Primary Syphilis	-	-	349	—	—	24·35
	Secondary „	-	-	191	—	4	15·60
	Tubercular Diseases	-	-	87	12	40	13·38
	Scurvy and Purpura	-	-	1	—	—	—
	Other diseases	-	-	28	—	1	2·80
	Total	-	-	898	13	63	71·19
	II.—Local Diseases.						
	Diseases of the—						
1	Nervous System	-	-	94	1	19	8·08
2	Eye	-	-	132	—	8	9·51
3	Ear	-	-	40	—	1	2·08
4	Nose	-	-	2	—	—	—
5	Circulatory System	-	-	89	3	42	9·73
6	Absorbent „	-	-	46	—	—	4·16
7	Ductless Glands	-	-	2	—	—	·03
8	Respiratory System	-	-	704	10	10	29·40
9	Digestive „	-	-	700	3	22	27·08
10	Urinary { Gonorrhœa	-	-	406	—	—	21·27
	System { Sequelæ of Gonorrhœa	-	-	50	—	3	3·50
	Other diseases	-	-	50	—	6	3·02
11	Generative System	-	-	68	—	2	3·29
12	Organs of Locomotion	-	-	84	—	6	2·64
13	Cellular Tissue	-	-	150	—	1	6·58
14	Cutaneous System	-	-	771	—	1	30·36
	III.—Debility	-	-	47	—	19	5·35
	IV.—Poisons	-	-	19	2	—	·58
	V.—Injuries.						
1	General	-	-	—	2	—	—
2	Local	-	-	766	3	6	34·63
3	In action	-	-	—	—	—	—
	No appreciable disease	-	-	9	—	—	·28
	Cause unknown (refers to deaths only)	-	-	—	—	—	—
	General total	-	-	5,480	39	211	286·61

* The average ratios for 10 years will be given in future years. The ratios for the year 1879 will be given

DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the TROOPS stationed in per 1,000 of the Strength and the Average Ratios for 10 Years.*

Ratio per 1,000.				*Average Ratio per 1,000, from 1879 to 18			
Admis- sions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.	Admis- sions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.
8.4	—	—	.26	—	—	—	—
12.1	.15	—	.24	—	—	—	—
—	—	—	—	—	—	—	—
33.2	—	.29	1.36	—	—	—	—
—	—	—	—	—	—	—	—
4.9	.15	—	.16	—	—	—	—
58.6	.29	.29	2.02	—	—	—	—
35.2	.15	2.62	2.19	—	—	—	—
50.8	—	—	3.54	—	—	—	—
27.8	—	.58	2.27	—	—	—	—
12.7	1.74	5.82	1.95	—	—	—	—
.1	—	—	—	—	—	—	—
4.1	—	.15	.41	—	—	—	—
130.7	1.89	9.17	10.36	—	—	—	—
13.7	.15	2.77	1.18	—	—	—	—
19.2	—	1.16	1.88	—	—	—	—
5.8	—	.15	.30	—	—	—	—
.3	—	—	—	—	—	—	—
13.0	.44	6.11	1.41	—	—	—	—
6.7	—	—	.61	—	—	—	—
.3	—	—	.01	—	—	—	—
102.5	1.45	1.45	4.28	—	—	—	—
101.9	.44	3.20	3.93	—	—	—	—
59.1	—	—	3.10	—	—	—	—
7.3	—	.44	.51	—	—	—	—
7.3	—	.87	.44	—	—	—	—
9.9	—	.29	.48	—	—	—	—
4.9	—	.87	.38	—	—	—	—
21.8	—	.15	.96	—	—	—	—
112.2	—	.15	4.42	—	—	—	—
6.8	—	2.77	.78	—	—	—	—
2.8	.29	—	.08	—	—	—	—
—	.29	—	—	—	—	—	—
111.5	.44	.87	5.04	—	—	—	—
—	—	—	—	—	—	—	—
1.3	—	—	.04	—	—	—	—
—	—	—	—	—	—	—	—
797.6	5.68	30.71	41.71	—	—	—	—

in the Report for 1880, those for 1879 to 1880 in that for 1881, those for 1879 to 1881 in that for 1882, &c., &c.

ABSTRACT G.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into HOSPITAL, the HOME DISTRICT during the Year 1879, with the Ratios per

Orders.	Average Strength, 7,022.		Admissions into Hospital.	Deaths.	Invalids Discharged the Service.	Average Number constantly Sick.
	Diseases.					
	I.—General Diseases.					
	Febrile Group.					
	Eruptive Fevers	- - -	44	—	—	2·79
	Continued „	- - -	122	1	—	4·46
	Yellow Fever	- - -	—	—	—	—
	Paroxysmal Fevers	- - -	33	—	—	·56
	Cholera	- - -	—	—	—	—
	Other diseases	- - -	60	2	—	1·69
	Total	- - -	259	3	—	9·50
	Constitutional Group.					
	Rheumatism	- - -	305	2	10	17·25
	Primary Syphilis	- - -	822	—	—	67·63
	Secondary „	- - -	250	—	16	21·12
	Tubercular Diseases	- - -	87	21	53	12·12
	Scurvy and Purpura	- - -	4	—	—	·15
	Other diseases	- - -	12	2	1	·79
	Total	- - -	1,480	25	80	119·06
	II.—Local Diseases					
	Diseases of the—					
1	Nervous System	- - -	91	2	25	7·19
2	Eye	- - -	89	—	3	4·85
3	Ear	- - -	25	—	4	1·37
4	Nose	- - -	4	—	—	·21
5	Circulatory System	- - -	78	5	33	6·75
6	Absorbent „	- - -	102	—	1	11·02
7	Ductless Glands	- - -	—	—	—	—
8	Respiratory System	- - -	839	8	8	36·83
9	Digestive „	- - -	741	1	6	20·60
	Urinary { Gonorrhœa	- - -	628	—	—	38·42
10	System { Sequelæ of Gonorrhœa	- - -	90	—	2	5·63
	Other diseases	- - -	93	4	6	4·08
11	Generative System	- - -	69	—	—	3·36
12	Organs of Locomotion	- - -	52	—	9	3·40
13	Cellular Tissue	- - -	243	1	2	9·10
14	Cutaneous System	- - -	581	—	1	18·52
	III.—Debility	- - -	81	—	13	4·88
	IV.—Poisons	- - -	15	1	—	·29
	V.—Injuries.					
1	General	- - -	—	—	—	—
2	Local	- - -	651	—	5	24·21
3	In action	- - -	—	—	—	—
	No appreciable disease	- - -	5	—	—	·46
	Cause unknown (refers to deaths only)	- - -	—	—	—	—
	General total	- - -	6,215	50	198	329·23

* The average ratios for 10 years will be given in future years. The ratios for the year 1879 will be given

DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the TROOPS stationed in 1,000 of the Strength, and the Average Ratios for 10 Years*

Ratio per 1,000.				*Average Ratio per 1,000, from 1879 to 18			
Admis- sions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.	Admis- sions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.
6.3	—	—	.40	—	—	—	—
17.4	.14	—	.63	—	—	—	—
4.7	—	—	.08	—	—	—	—
8.5	.29	—	.24	—	—	—	—
36.9	.43	—	1.35	—	—	—	—
43.4	.29	1.42	2.46	—	—	—	—
117.1	—	—	9.63	—	—	—	—
35.6	—	2.28	3.01	—	—	—	—
12.4	2.99	7.55	1.73	—	—	—	—
.6	—	—	.02	—	—	—	—
1.7	.29	.14	.11	—	—	—	—
210.8	3.56	11.39	16.96	—	—	—	—
13.0	.29	3.56	1.02	—	—	—	—
12.7	—	.43	.62	—	—	—	—
3.6	—	.57	.20	—	—	—	—
.6	—	—	.03	—	—	—	—
11.1	.71	4.70	.96	—	—	—	—
14.5	—	.14	1.57	—	—	—	—
119.5	1.13	1.14	5.24	—	—	—	—
105.5	.14	.85	2.93	—	—	—	—
89.4	—	—	5.47	—	—	—	—
12.8	—	.29	.80	—	—	—	—
13.3	.58	.85	.58	—	—	—	—
9.8	—	—	.48	—	—	—	—
7.4	—	1.28	.48	—	—	—	—
34.5	.14	.29	1.30	—	—	—	—
82.7	—	.14	2.64	—	—	—	—
11.5	—	1.85	.69	—	—	—	—
2.1	.14	—	.04	—	—	—	—
—	—	—	—	—	—	—	—
92.7	—	.71	3.45	—	—	—	—
.7	—	—	.07	—	—	—	—
—	—	—	—	—	—	—	—
885.1	7.12	28.19	46.88	—	—	—	—

in the Report for 1880, those for 1879 to 1880 in that for 1881, those for 1879 to 1881 in that for 1882, &c., &c.

ABSTRACT H.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into HOSPITAL, the WOOLWICH DISTRICT during the Year 1879, with the Ratios

Orders.	Average Strength, 5,402.			Admis- sions into Hospital.	Deaths.	Invalids Discharged the Service.	Average Number constantly Sick.
	Diseases.						
	I.—General Diseases.						
	Febrile Group.						
	Eruptive Fevers	-	-	44	—	—	1·50
	Continued „	-	-	25	—	—	1·05
	Yellow Fever	-	-	—	—	—	—
	Paroxysmal Fevers	-	-	129	—	—	3·60
	Cholera	-	-	—	—	—	—
	Other diseases	-	-	460	1	—	9·41
	Total	-	-	658	1	—	15·56
	Constitutional Group.						
	Rheumatism	-	-	188	—	5	11·32
	Primary Syphilis	-	-	237	—	—	19·67
	Secondary „	-	-	312	—	8	27·91
	Tubercular Diseases	-	-	53	11	28	8·70
	Scurvy and Purpura	-	-	2	—	—	·07
	Other diseases	-	-	14	1	3	·48
	Total	-	-	806	12	44	68·15
	II.—Local Diseases.						
	Diseases of the—						
1	Nervous System	-	-	52	3	11	5·02
2	Eye	-	-	58	—	8	3·72
3	Ear	-	-	30	—	9	2·82
4	Nose	-	-	—	—	—	—
5	Circulatory System	-	-	50	3	27	5·40
6	Absorbent „	-	-	45	—	—	5·70
7	Ductless Glands	-	-	—	—	—	—
8	Respiratory System	-	-	288	8	24	18·20
9	Digestive „	-	-	491	1	12	14·30
	Urinary { Gonorrhœa	-	-	277	—	—	15·70
10	System { Sequelæ of Gonorrhœa	-	-	107	—	2	7·28
	Other diseases	-	-	36	1	3	2·24
11	Generative System	-	-	53	—	2	3·21
12	Organs of Locomotion	-	-	34	—	7	3·01
13	Cellular Tissue	-	-	90	—	—	4·50
14	Cutaneous System	-	-	429	—	—	18·20
	III.—Debility	-	-	61	—	11	3·73
	IV.—Poisons	-	-	2	1	—	·01
	V.—Injuries.						
1	General	-	-	—	2	—	—
2	Local	-	-	417	1	3	19·03
3	In action	-	-	—	—	—	—
	No appreciable disease	-	-	53	—	—	·55
	Cause unknown (refers to deaths only)	-	-	—	—	—	—
	General total	-	-	4,037	33	163	216·33

* The average ratios for 10 years will be given in future years. The ratios for the year 1879 will be given

DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the TROOPS stationed in per 1,000 of the Strength, and the Average Ratios for 10 Years.*

Ratio per 1,000.				*Average Ratio per 1,000, from 1879 to 18 .			
Admis- sions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.	Admis- sions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.
8.1	—	—	.28	—	—	—	—
4.6	—	—	.19	—	—	—	—
—	—	—	—	—	—	—	—
23.9	—	—	.67	—	—	—	—
—	—	—	—	—	—	—	—
85.2	.19	—	1.74	—	—	—	—
121.8	.19	—	2.88	—	—	—	—
34.8	—	.93	2.10	—	—	—	—
43.9	—	—	3.64	—	—	—	—
57.7	—	1.48	5.17	—	—	—	—
9.8	2.03	5.18	1.61	—	—	—	—
.4	—	—	.01	—	—	—	—
2.6	.19	.55	.09	—	—	—	—
149.2	2.22	8.14	12.62	—	—	—	—
9.6	.55	2.04	.93	—	—	—	—
10.7	—	1.48	.69	—	—	—	—
5.5	—	1.66	.52	—	—	—	—
—	—	—	—	—	—	—	—
9.3	.55	5.00	1.00	—	—	—	—
8.3	—	—	1.06	—	—	—	—
—	—	—	—	—	—	—	—
53.8	1.48	4.44	3.37	—	—	—	—
90.9	.19	2.22	2.64	—	—	—	—
51.3	—	—	2.91	—	—	—	—
19.8	—	.37	1.35	—	—	—	—
6.7	.19	.55	.41	—	—	—	—
9.8	—	.37	.59	—	—	—	—
6.3	—	1.30	.56	—	—	—	—
16.7	—	—	.83	—	—	—	—
79.4	—	—	3.37	—	—	—	—
11.3	—	2.04	.69	—	—	—	—
.4	.19	—		—	—	—	—
—	.37	—	—	—	—	—	—
77.2	.19	.55	3.52	—	—	—	—
—	—	—	—	—	—	—	—
9.8	—	—	.10	—	—	—	—
—	—	—	—	—	—	—	—
747.3	6.11	30.16	40.04	—	—	—	—

in the Report for 1880, those for 1879 to 1880 in that for 1881, those for 1879 to 1881 in that for 1882, &c., &c.

Q 1913.

H

ABSTRACT I.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into HOSPITAL, the ALDERSHOT DISTRICT during the Year 1879, with the Ratios

Orders.	Average Strength, 11,019.			Admissions into Hospital.	Deaths.	Invalids Discharged the Service.	Average Number constantly Sick.
	Diseases.						
	I.—General Diseases.						
	Febrile Group.						
	Eruptive Fevers	-	-	68	—	—	3·04
	Continued „	-	-	241	4	—	10·00
	Yellow Fever	-	-	—	—	—	—
	Paroxysmal Fevers	-	-	77	—	1	3·60
	Cholera	-	-	—	—	—	—
	Other diseases	-	-	32	—	—	1·00
	Total	-	-	418	4	1	17·64
	Constitutional Group.						
	Rheumatism	-	-	418	1	20	24·40
	Primary Syphilis	-	-	622	—	—	44·00
	Secondary „	-	-	210	—	5	11·33
	Tubercular Diseases	-	-	78	22	37	7·61
	Scurvy and Purpura	-	-	1	—	—	—
	Other diseases	-	-	4	—	—	·25
	Total	-	-	1,328	23	62	87·59
	II.—Local Diseases.						
	Diseases of the—						
1	Nervous System	-	-	92	3	28	6·50
2	Eye	-	-	133	—	12	7·00
3	Ear	-	-	68	—	11	4·42
4	Nose	-	-	4	—	1	·15
5	Circulatory System	-	-	132	6	74	10·70
6	Absorbent „	-	-	210	—	—	20·45
7	Ductless Glands	-	-	2	—	—	·08
8	Respiratory System	-	-	726	14	24	42·38
9	Digestive „	-	-	882	5	51	33·58
10	Urinary { Gonorrhœa	-	-	964	—	—	52·11
	System { Sequelæ of Gonorrhœa	-	-	44	—	2	3·10
	Other diseases	-	-	93	—	3	5·46
11	Generative System	-	-	153	—	1	7·04
12	Organs of Locomotion	-	-	62	1	24	4·52
13	Cellular Tissue	-	-	273	—	—	10·55
14	Cutaneous System	-	-	1,195	—	13	48·80
	III.—Debility	-	-	128	—	52	8·06
	IV.—Poisons	-	-	4	—	—	·30
	V.—Injuries.						
1	General	-	-	1	4	—	3·09
2	Local	-	-	903	4	13	8·77
3	In action	-	-	—	—	—	—
	No appreciable disease	-	-	21	—	—	1·33
	Cause unknown (refers to deaths only)	-	-	—	—	—	—
	General total	-	-	7,836	64	372	413·62

* The average ratios for 10 years will be given in future years. The ratios for the year 1879 will be given

DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the TROOPS stationed in per 1,000 of the Strength, and the Average Ratios for 10 Years.*

Ratio per 1,000.				*Average Ratio per 1,000, from 1879 to 18			
Admissions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.	Admissions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.
6.2	—	—	.27	—	—	—	—
21.9	.36	—	.91	—	—	—	—
—	—	—	—	—	—	—	—
6.9	—	.09	.33	—	—	—	—
—	—	—	—	—	—	—	—
2.9	—	—	.09	—	—	—	—
37.9	.36	.09	1.60	—	—	—	—
37.5	.09	1.81	2.22	—	—	—	—
56.4	—	—	3.99	—	—	—	—
19.0	—	.45	1.03	—	—	—	—
7.1	2.05	3.86	.69	—	—	—	—
.1	—	—	—	—	—	—	—
.4	—	—	.02	—	—	—	—
120.5	2.14	5.62	7.95	—	—	—	—
8.3	.27	2.54	.59	—	—	—	—
12.1	—	1.09	.64	—	—	—	—
6.2	—	1.00	.40	—	—	—	—
.4	—	.09	.01	—	—	—	—
12.0	.55	6.72	.97	—	—	—	—
19.1	—	—	1.86	—	—	—	—
.2	—	—	.01	—	—	—	—
65.9	1.27	2.18	3.85	—	—	—	—
80.0	.45	4.63	3.05	—	—	—	—
87.5	—	—	4.73	—	—	—	—
4.0	—	.18	.28	—	—	—	—
8.4	—	.27	.49	—	—	—	—
13.9	—	.09	.64	—	—	—	—
5.6	.09	2.18	.41	—	—	—	—
24.8	—	—	.96	—	—	—	—
108.4	—	1.18	4.43	—	—	—	—
11.6	—	4.72	.73	—	—	—	—
.4	—	—	.03	—	—	—	—
.1	.36	—	.27	—	—	—	—
81.9	.36	1.18	3.52	—	—	—	—
—	—	—	—	—	—	—	—
1.9	—	—	.12	—	—	—	—
—	—	—	—	—	—	—	—
711.1	5.85	33.76	37.54	—	—	—	—

in the Report for 1880, those for 1879 to 1880 in that for 1881, those for 1879 to 1881 in that for 1882, &c., &c.

ABSTRACT J.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into HOSPITAL, the NORTH BRITISH DISTRICT during the Year 1879, with the Ratios

Orders.	Average Strength, 3,334.			Admis- sions into Hospital.	Deaths.	Invalids Discharged the Service.	Average Number constantly Sick.
	Diseases.						
	I.—General Diseases.						
	Febrile Group.						
	Eruptive Fevers	-	-	12	—	—	·61
	Continued "	-	-	27	—	—	1·37
	Yellow Fever	-	-	—	—	—	—
	Paroxysmal Fevers	-	-	96	—	—	4·90
	Cholera	-	-	—	—	—	—
	Other diseases	-	-	14	—	—	·75
	Total	-	-	149	—	—	7·63
	Constitutional Group.						
	Rheumatism	-	-	120	1	6	6·13
	Primary Syphilis	-	-	185	—	—	9·45
	Secondary "	-	-	117	1	2	5·97
	Tubercular Diseases	-	-	44	5	19	2·27
	Scurvy and Purpura	-	-	—	—	—	—
	Other diseases	-	-	2	—	—	·10
	Total	-	-	468	7	27	23·92
	II.—Local Diseases.						
	Diseases of the—						
1	Nervous System	-	-	43	4	6	2·19
2	Eye	-	-	24	—	—	1·22
3	Ear	-	-	10	—	1	·50
4	Nose	-	-	1	—	—	·05
5	Circulatory System	-	-	66	6	18	3·37
6	Absorbent "	-	-	50	—	—	2·55
7	Ductless Glands	-	-	2	—	—	·10
8	Respiratory System	-	-	325	10	5	16·60
9	Digestive "	-	-	300	1	8	15·33
10	Urinary { Gonorrhœa	-	-	236	—	—	12·05
	System { Sequelæ of Gonorrhœa	-	-	21	—	—	1·07
	Other diseases	-	-	51	2	3	2·60
11	Generative System	-	-	44	—	1	2·27
12	Organs of Locomotion	-	-	14	—	4	·75
13	Cellular Tissue	-	-	76	—	2	3·84
14	Cutaneous System	-	-	385	—	—	19·67
	III.—Debility	-	-	23	—	2	1·17
	IV.—Poisons	-	-	5	1	—	·25
	V.—Injuries.						
1	General	-	-	—	—	—	—
2	Local	-	-	384	1	1	19·62
3	In action	-	-	—	—	—	—
	No appreciable disease	-	-	4	—	—	·29
	Cause unknown (refers to deaths only)	-	-	—	—	—	—
	General total	-	-	2,681	32	78	137·04

* The average ratios for 10 years will be given in future years. The ratios for the year 1879 will be given.

DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the TROOPS stationed in per 1,000 of the Strength, and the Average Ratios for 10 Years.*

Ratio per 1,000.				*Average Ratio per 1,000, from 1879 to 18			
Admis- sions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.	Admis- sions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.
3·6	—	—	·18	—	—	—	—
8·1	—	—	·41	—	—	—	—
—	—	—	—	—	—	—	—
28·8	—	—	1·47	—	—	—	—
—	—	—	—	—	—	—	—
4·2	—	—	·23	—	—	—	—
44·7	—	—	2·29	—	—	—	—
36·0	·30	1·79	1·84	—	—	—	—
55·5	—	—	2·83	—	—	—	—
35·1	·30	·59	1·79	—	—	—	—
13·2	1·50	5·69	·68	—	—	—	—
—	—	—	—	—	—	—	—
·6	—	—	·03	—	—	—	—
140·4	2·10	8·07	7·17	—	—	—	—
12·9	1·20	1·79	·66	—	—	—	—
7·2	—	—	·36	—	—	—	—
3·0	—	·29	·15	—	—	—	—
·3	—	—	·01	—	—	—	—
19·8	1·80	5·39	1·01	—	—	—	—
15·0	—	—	·77	—	—	—	—
·6	—	—	·03	—	—	—	—
97·5	3·00	1·49	4·98	—	—	—	—
90·0	·30	2·49	4·60	—	—	—	—
70·8	—	—	3·61	—	—	—	—
6·3	—	—	·32	—	—	—	—
15·3	·60	·89	·78	—	—	—	—
13·2	—	·29	·68	—	—	—	—
4·2	—	1·29	·23	—	—	—	—
22·8	—	·39	1·15	—	—	—	—
115·4	—	—	5·90	—	—	—	—
6·9	—	·59	·35	—	—	—	—
1·5	·30	—	·07	—	—	—	—
—	—	—	—	—	—	—	—
115·1	·30	·29	5·89	—	—	—	—
—	—	—	—	—	—	—	—
1·2	—	—	·09	—	—	—	—
—	—	—	—	—	—	—	—
804·1	9·60	23·26	41·10	—	—	—	—

in the Report for 1880, those for 1879 to 1880 in that for 1881, those for 1879 to 1881 in that for 1882, &c., &c.

ABSTRACT K.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into HOSPITAL, the CHANNEL ISLES during the Year 1879, with the Ratios per

Orders.	Average Strength, 1,324.			Admissions into Hospital.	Deaths.	Invalids Discharged the Service.	Average Number constantly Sick.
	Diseases.						
I.—General Diseases.							
Febrile Group.							
	Eruptive Fevers	-	-	1	—	—	·04
	Continued "	-	-	52	—	—	·81
	Yellow Fever	-	-	—	—	—	—
	Paroxysmal Fevers	-	-	6	—	—	·09
	Cholera	-	-	—	—	—	—
	Other diseases	-	-	—	—	—	—
	Total	-	-	59	—	—	·94
Constitutional Group.							
	Rheumatism	-	-	45	—	—	2·36
	Primary Syphilis	-	-	119	—	—	6·60
	Secondary "	-	-	48	—	—	2·63
	Tubercular Diseases	-	-	13	5	1	1·85
	Scurvy and Purpura	-	-	—	—	—	—
	Other diseases	-	-	5	—	—	·29
	Total	-	-	230	5	1	13·73
II.—Local Diseases.							
Diseases of the—							
1	Nervous System	-	-	13	—	5	·63
2	Eye	-	-	21	—	2	·94
3	Ear	-	-	6	—	1	·21
4	Nose	-	-	—	—	—	—
5	Circulatory System	-	-	20	—	5	·81
6	Absorbent "	-	-	62	—	—	6·12
7	Ductless Glands	-	-	—	—	—	—
8	Respiratory System	-	-	114	—	—	3·52
9	Digestive "	-	-	167	—	2	3·77
10	Urinary { Gonorrhœa	-	-	215	—	—	8·85
	System { Sequelæ of Gonorrhœa	-	-	46	—	—	2·79
	Other diseases	-	-	22	—	—	·79
11	Generative System	-	-	13	—	—	·40
12	Organs of Locomotion	-	-	6	—	1	·94
13	Cellular Tissue	-	-	30	—	—	·81
14	Cutaneous System	-	-	224	—	—	6·10
	III.—Debility	-	-	16	—	5	1·46
	IV.—Poisons	-	-	9	1	—	·15
V.—Injuries.							
1	General	-	-	—	1	—	—
2	Local	-	-	231	—	2	7·75
3	In action	-	-	—	—	—	—
	No appreciable disease	-	-	1	—	—	·06
	Cause unknown (refers to deaths only)	-	-	—	—	—	—
	General total	-	-	1,505	7	24	60·27

* The average ratios for 10 years will be given in future years. The ratios for the year 1879 will be given

DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the Troops stationed in 1,000 of the Strength, and the Average Ratios for 10 Years.*

Ratio per 1,000.				*Average Ratio per 1,000, from 1879 to 18 .			
Admis- sions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.	Admis- sions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.
·8	—	—	·03	—	—	—	—
39·3	—	—	·61	—	—	—	—
—	—	—	—	—	—	—	—
4·5	—	—	·07	—	—	—	—
—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—
44·6	—	—	·71	—	—	—	—
34·0	—	—	1·78	—	—	—	—
89·9	—	—	4·98	—	—	—	—
36·2	—	—	1·99	—	—	—	—
9·8	3·78	·75	1·40	—	—	—	—
—	—	—	—	—	—	—	—
3·8	—	—	·22	—	—	—	—
173·7	3·78	·75	10·37	—	—	—	—
9·8	—	3·78	·48	—	—	—	—
15·9	—	1·51	·71	—	—	—	—
4·5	—	·75	·16	—	—	—	—
—	—	—	—	—	—	—	—
15·1	—	3·78	·61	—	—	—	—
46·8	—	—	4·62	—	—	—	—
—	—	—	—	—	—	—	—
86·1	—	—	2·66	—	—	—	—
126·1	—	1·51	2·85	—	—	—	—
162·4	—	—	6·31	—	—	—	—
34·7	—	—	2·11	—	—	—	—
16·6	—	—	·60	—	—	—	—
9·8	—	—	·30	—	—	—	—
4·5	—	·75	·71	—	—	—	—
22·7	—	—	·61	—	—	—	—
169·2	—	—	4·61	—	—	—	—
12·1	—	3·78	1·10	—	—	—	—
6·8	·75	—	·11	—	—	—	—
—	·75	—	—	—	—	—	—
174·5	—	1·51	5·85	—	—	—	—
—	—	—	—	—	—	—	—
·8	—	—	·04	—	—	—	—
—	—	—	—	—	—	—	—
1,136·7	5·28	18·12	45·52	—	—	—	—

in the Report for 1880, those for 1879 to 1880 in that for 1881, those for 1879 to 1881 in that for 1882, &c., &c.

ABSTRACT L.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS, into HOSPITAL, the BELFAST DISTRICT during the Year 1879, with the Ratios

Orders.	Average Strength, 2,136.			Admissions into Hospital.	Deaths.	Invalids Discharged the Service.	Average Number constantly Sick.
	Diseases.						
	I.—General Diseases.						
	Febrile Group.						
	Eruptive Fevers	-	-	8	1	—	·58
	Continued „	-	-	46	2	—	1·15
	Yellow Fever	-	-	—	—	—	—
	Paroxysmal Fevers	-	-	31	—	—	·43
	Cholera	-	-	—	—	—	—
	Other diseases	-	-	42	—	—	1·32
	Total	-	-	127	3	—	3·48
	Constitutional Group.						
	Rheumatism	-	-	109	—	7	5·40
	Primary Syphilis	-	-	193	—	—	12·85
	Secondary „	-	-	53	—	—	3·39
	Tubercular Diseases	-	-	86	2	8	2·78
	Scurvy and Purpura	-	-	—	—	—	—
	Other diseases	-	-	1	—	—	·03
	Total	-	-	392	2	15	24·45
	II.—Local Diseases.						
	Diseases of the—						
1	Nervous System	-	-	48	1	6	2·45
2	Eye	-	-	84	—	3	1·61
3	Ear	-	-	19	—	2	·55
4	Nose	-	-	—	—	—	—
5	Circulatory System	-	-	46	4	9	1·96
6	Absorbent „	-	-	54	—	—	5·36
7	Ductless Glands	-	-	—	—	—	—
8	Respiratory System	-	-	253	3	7	11·36
9	Digestive „	-	-	234	1	3	4·32
10	Urinary { Gonorrhœa	-	-	181	—	—	6·26
	System { Sequelæ of Gonorrhœa	-	-	14	—	—	·86
	Other diseases	-	-	25	—	1	1·78
11	Generative System	-	-	40	—	3	1·06
12	Organs of Locomotion	-	-	12	—	4	·82
13	Cellular Tissue	-	-	58	—	—	1·62
14	Cutaneous System	-	-	302	—	—	8·91
	III.—Debility	-	-	83	—	13	1·60
	IV.—Poisons	-	-	6	—	—	·21
	V.—Injuries.						
1	General	-	-	2	—	—	·06
2	Local	-	-	225	—	6	7·00
3	In action	-	-	—	—	—	—
	No appreciable disease	-	-	5	—	—	·81
	Cause unknown (refers to deaths only)	-	-	—	—	—	—
	General total	-	-	2,110	14	72	86·53

* The average ratios for 10 years will be given in future years. The ratios for the year 1879 will be given

DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the TROOPS stationed in per 1,000 of the Strength, and the Average Ratios for 10 Years.*

Ratio per 1,000.				*Average Ratio per 1,000, from 1879 to 18 .			
Admissions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.	Admissions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.
3.7	.47	—	.27	—	—	—	—
21.5	.94	—	.54	—	—	—	—
—	—	—	—	—	—	—	—
14.5	—	—	.20	—	—	—	—
—	—	—	—	—	—	—	—
19.7	—	—	.62	—	—	—	—
59.4	1.40	—	1.63	—	—	—	—
51.0	—	3.28	2.53	—	—	—	—
90.3	—	—	6.01	—	—	—	—
24.8	—	—	1.59	—	—	—	—
16.9	.94	3.74	1.30	—	—	—	—
—	—	—	—	—	—	—	—
.5	—	—	.01	—	—	—	—
183.5	.94	7.02	11.44	—	—	—	—
22.5	.47	2.81	1.15	—	—	—	—
15.9	—	1.40	.75	—	—	—	—
8.9	—	.94	.26	—	—	—	—
—	—	—	—	—	—	—	—
21.5	1.87	4.21	.92	—	—	—	—
25.3	—	—	2.51	—	—	—	—
—	—	—	—	—	—	—	—
118.4	1.40	3.28	5.32	—	—	—	—
109.6	.47	1.40	2.02	—	—	—	—
84.7	—	—	2.93	—	—	—	—
6.6	—	—	.40	—	—	—	—
11.7	—	.47	.83	—	—	—	—
18.7	—	1.40	.50	—	—	—	—
5.6	—	1.87	.38	—	—	—	—
27.2	—	—	.76	—	—	—	—
141.4	—	—	4.17	—	—	—	—
15.5	—	6.09	.75	—	—	—	—
2.8	—	2.81	.10	—	—	—	—
.9	—	—	.03	—	—	—	—
105.4	—	—	3.28	—	—	—	—
—	—	—	—	—	—	—	—
2.3	—	—	.38	—	—	—	—
—	—	—	—	—	—	—	—
987.8	6.55	33.70	40.51	—	—	—	—

in the Report for 1880, those for 1879 to 1880 in that for 1881, those for 1879 to 1881 in that for 1882, &c., &c.

ABSTRACT M.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into HOSPITAL, the DUBLIN DISTRICT during the Year 1879, with the Ratios

Orders.	Average Strength, 9,139.				Admissions into Hospital.	Deaths.	Invalids Discharged the Service.	Average Number constantly Sick.
	Diseases.							
	I.—General Diseases.							
	Febrile Group.							
	Eruptive Fevers	-	-	-	36	—	—	2·00
	Continued „	-	-	-	178	1	—	8·00
	Yellow Fever	-	-	-	—	—	—	—
	Paroxysmal Fevers	-	-	-	44	—	—	1·41
	Cholera	-	-	-	—	—	—	—
	Other diseases	-	-	-	25	—	—	1·00
	Total	-	-	-	283	1	—	12·41
	Constitutional Group.							
	Rheumatism	-	-	-	296	1	10	15·50
	Primary Syphilis	-	-	-	811	—	—	68·25
	Secondary „	-	-	-	283	—	2	16·08
	Tubercular Diseases	-	-	-	77	24	18	10·83
	Scurvy and Purpura	-	-	-	4	—	—	·25
	Other diseases	-	-	-	8	—	—	1·08
	Total	-	-	-	1,479	25	30	111·99
	II.—Local Diseases.							
	Diseases of the—							
1	Nervous System	-	-	-	97	4	24	10·25
2	Eye	-	-	-	148	—	4	7·08
3	Ear	-	-	-	42	—	3	3·00
4	Nose	-	-	-	5	—	1	·25
5	Circulatory System	-	-	-	102	2	16	10·83
6	Absorbent „	-	-	-	190	—	1	17·08
7	Ductless Glands	-	-	-	—	—	—	—
8	Respiratory System	-	-	-	918	8	10	50·08
9	Digestive „	-	-	-	815	2	6	23·00
	Urinary { Gonorrhœa	-	-	-	708	—	—	38·83
10	System { Sequelæ of Gonorrhœa	-	-	-	84	—	1	7·41
	Other diseases	-	-	-	61	1	1	3·33
11	Generative System	-	-	-	90	—	—	5·33
12	Organs of Locomotion	-	-	-	53	—	13	4·83
13	Cellular Tissue	-	-	-	182	—	—	7·00
14	Cutaneous System	-	-	-	1,117	—	2	39·75
	III.—Debility	-	-	-	82	—	13	5·91
	IV.—Poisons	-	-	-	4	—	—	·08
	V.—Injuries.							
1	General	-	-	-	—	3	—	—
2	Local	-	-	-	863	1	4	30·77
3	In action	-	-	-	—	—	—	—
	No appreciable disease	-	-	-	22	—	—	1·83
	Ca use unknown (refers to deaths only)	-	-	-	—	—	—	—
	General total	-	-	-	7,345	47	129	390·54

* The average ratios for 10 years will be given in future years. The ratios for the year 1879 will be given.

DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the TROOPS stationed in per 1,000 of the Strength, and the Average Ratios for 10 Years.*

Ratio per 1,000.				*Average Ratio per 1,000, from 1879 to 18			
Admis- sions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.	Admis- sions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.
3·9	—	—	·22	—	—	—	—
19·5	·11	—	·87	—	—	—	—
—	—	—	—	—	—	—	—
4·8	—	—	·15	—	—	—	—
—	—	—	—	—	—	—	—
2·7	—	—	·11	—	—	—	—
30·9	·11	—	1·35	—	—	—	—
32·4	·11	1·09	1·69	—	—	—	—
88·7	—	—	7·47	—	—	—	—
31·0	—	·22	1·76	—	—	—	—
8·4	2·63	1·97	1·18	—	—	—	—
·4	—	—	·03	—	—	—	—
·9	—	—	·12	—	—	—	—
161·8	2·74	3·28	12·25	—	—	—	—
10·6	·43	2·63	1·12	—	—	—	—
16·2	—	·44	·77	—	—	—	—
4·6	—	·38	·33	—	—	—	—
·5	—	·11	·08	—	—	—	—
11·2	·22	1·75	1·13	—	—	—	—
20·8	—	·11	1·87	—	—	—	—
—	—	—	—	—	—	—	—
100·5	·87	1·09	5·48	—	—	—	—
89·2	·22	·66	2·52	—	—	—	—
77·5	—	—	4·25	—	—	—	—
9·2	—	·11	·81	—	—	—	—
6·7	·11	·11	·36	—	—	—	—
9·9	—	—	·58	—	—	—	—
5·8	—	1·42	·53	—	—	—	—
19·9	—	—	·77	—	—	—	—
122·2	—	·22	4·35	—	—	—	—
9·0	—	1·42	·65	—	—	—	—
·4	—	—	·01	—	—	—	—
—	·33	—	—	—	—	—	—
94·4	·11	·44	3·37	—	—	—	—
—	—	—	—	—	—	—	—
2·4	—	—	·20	—	—	—	—
—	—	—	—	—	—	—	—
808·7	5·14	14·12	42·73	—	—	—	—

in the Report for 1880, those for 1879 to 1880 in that for 1881, those for 1879 to 1881 in that for 1882, &c., &c.

ABSTRACT N.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into HOSPITAL, the CORK DISTRICT during the Year 1879, with the Ratios per

Orders.	Average Strength, 6,140.			Admissions into Hospital.	Deaths.	Invalids Discharged the Service.	Average Number constantly Sick.
	Diseases.						
I.—General Diseases.							
Febrile Group.							
	Eruptive fevers	-	-	36	2	—	3·65
	Continued „	-	-	136	4	—	8·60
	Yellow Fever	-	-	—	—	—	—
	Paroxysmal Fevers	-	-	120	—	—	3·32
	Cholera	-	-	—	—	—	—
	Other diseases	-	-	154	—	—	4·04
	Total	-	-	446	6	—	19·61
Constitutional Group.							
	Rheumatism	-	-	196	—	8	11·61
	Primary Syphilis	-	-	267	—	—	17·95
	Secondary „	-	-	115	1	1	6·94
	Tubercular Diseases	-	-	60	10	28	5·46
	Scurvy and Purpura	-	-	—	—	—	—
	Other diseases	-	-	10	—	—	·66
	Total	-	-	648	11	37	42·62
II.—Local Diseases.							
Diseases of the—							
1	Nervous System	-	-	65	—	16	3·91
2	Eye	-	-	116	—	8	5·68
3	Ear	-	-	39	—	2	2·07
4	Nose	-	-	5	—	—	·11
5	Circulatory System	-	-	67	2	15	6·12
6	Absorbent „	-	-	76	—	—	5·14
7	Ductless Glands	-	-	—	—	—	—
8	Respiratory System	-	-	547	11	2	19·83
9	Digestive „	-	-	676	4	3	19·62
10	Urinary { Gonorrhœa	-	-	376	—	—	16·96
	System { Sequelæ of Gonorrhœa	-	-	53	—	2	2·96
	Other diseases	-	-	57	—	1	1·69
11	Generative System	-	-	55	—	1	2·77
12	Organs of Locomotion	-	-	50	—	6	3·28
13	Cellular Tissue	-	-	120	—	—	6·93
14	Cutaneous System	-	-	906	—	1	34·94
	III.—Debility	-	-	36	—	5	3·68
	IV.—Poisons	-	-	3	—	—	·12
V.—Injuries.							
1	General	-	-	2	4	—	·03
2	Local	-	-	769	1	4	28·02
3	In action	-	-	—	—	—	—
	No appreciable disease	-	-	42	—	—	·70
	Cause unknown (refers to deaths only)	-	-	—	—	—	—
	General total	-	-	5,154	39	103	226·79

* The average ratios for 10 years will be given in future years. The ratios for the year 1879 will be given

DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the TROOPS stationed in 1,000 of the Strength, and the Average Ratios for 10 Years.*

Ratio per 1,000.				*Average Ratio per 1,000, from 1879 to 18 .			
Admis- sions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.	Admis- sions.	Deaths.	Invalids Discharged the Service.	Constantly Sick.
5.9	.33	—	.59	—	—	—	—
22.1	.65	—	1.40	—	—	—	—
—	—	—	—	—	—	—	—
19.5	—	—	.54	—	—	—	—
—	—	—	—	—	—	—	—
25.1	—	—	.66	—	—	—	—
—	—	—	—	—	—	—	—
72.6	.98	—	3.19	—	—	—	—
—	—	—	—	—	—	—	—
31.9	—	1.30	1.89	—	—	—	—
43.5	—	—	2.92	—	—	—	—
18.7	.16	.16	1.13	—	—	—	—
9.8	1.63	4.56	.89	—	—	—	—
—	—	—	—	—	—	—	—
1.6	—	—	.11	—	—	—	—
—	—	—	—	—	—	—	—
105.5	1.79	6.02	6.94	—	—	—	—
—	—	—	—	—	—	—	—
10.6	—	2.61	.64	—	—	—	—
18.9	—	1.30	.92	—	—	—	—
6.4	—	.33	.34	—	—	—	—
.8	—	—	.02	—	—	—	—
10.9	.33	2.44	1.00	—	—	—	—
12.4	—	—	.84	—	—	—	—
—	—	—	—	—	—	—	—
89.1	1.79	.33	3.23	—	—	—	—
110.1	.65	.49	3.20	—	—	—	—
61.2	—	—	2.76	—	—	—	—
8.6	—	.33	.48	—	—	—	—
9.3	—	.16	.28	—	—	—	—
9.0	—	.16	.45	—	—	—	—
8.1	—	.98	.53	—	—	—	—
19.5	—	—	1.13	—	—	—	—
147.6	—	.16	5.69	—	—	—	—
—	—	—	—	—	—	—	—
5.9	—	.81	.60	—	—	—	—
.5	—	—	.02	—	—	—	—
—	—	—	—	—	—	—	—
.3	.65	—	.01	—	—	—	—
125.3	.16	.65	4.56	—	—	—	—
—	—	—	—	—	—	—	—
6.8	—	—	.11	—	—	—	—
—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—
839.4	6.35	16.77	36.94	—	—	—	—

in the Report for 1880, those for 1879 to 1880 in that for 1881, those for 1879 to 1881 in that for 1882, &c., &c.

ABSTRACT No. II.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into stationed at GIBRALTAR during the year 1879, with the Ratios per

Orders.	Average Strength, 4,516.		Deaths.			Invalids.		Average Number constantly Sick.
	Diseases.	Admissions into Hospital.	In the Command.	Of Invalids.	Total.	Number sent Home.	Number finally Discharged the Service.	
	I.—General Diseases.							
	<i>Febrile Group.</i>							
	Eruptive Fevers - -	5	—	—	—	—	—	·75
	Continued „ - -	432	4	—	4	10	—	22·10
	Yellow Fever - -	—	—	—	—	—	—	—
	Paroxysmal Fevers - -	1,820	12	3	15	154	—	48·02
	Cholera - -	—	—	—	—	—	—	—
	Other Diseases - -	5	—	—	—	—	—	·45
	Total - -	1,762	16	3	19	164	—	71·32
	<i>Constitutional Group.</i>							
	Rheumatism - -	250	—	—	—	34	6	21·09
	Primary Syphilis - -	142	—	—	—	—	—	15·03
	Secondary „ - -	85	—	—	—	1	2	2·23
	Tubercular diseases - -	29	4	2	6	22	20	4·19
	Scurvy and Purpura - -	3	—	—	—	—	—	·21
	Other Diseases - -	6	1	—	1	—	—	1·20
	Total - -	465	5	2	7	57	28	43·95
	II.—Local Diseases.							
	<i>Diseases of the—</i>							
1	Nervous System - -	20	2	—	2	3	1	2·21
2	Eye - -	54	—	—	—	11	6	5·18
3	Ear - -	28	—	—	—	3	1	1·40
4	Nose - -	3	—	—	—	—	—	·16
5	Circulatory System - -	36	4	1	5	12	8	2·10
6	Absorbent „ - -	144	—	—	—	8	—	13·26
7	Ductless Glands - -	—	—	—	—	—	—	—
8	Respiratory System - -	175	7	1	8	24	7	16·07
9	Digestive „ - -	305	—	—	—	16	15	18·28
10	Urinary { Gonorrhœa - -	165	—	—	—	—	—	7·09
	{ Sequelæ of Gonorr. - -	41	—	—	—	—	—	2·55
	{ Other diseases - -	11	—	1	1	—	—	1·76
11	Generative System - -	46	—	—	—	—	—	6·46
12	Organs of Locomotion - -	22	—	—	—	4	5	·93
13	Cellular Tissue - -	107	—	—	—	1	2	5·17
14	Cutaneous System - -	150	—	—	—	1	—	6·26
	III.—Debility - -	73	—	—	—	28	22	4·45
	IV.—Poisons - -	65	—	—	—	—	—	2·09
	V.—Injuries.							
1	General - -	—	2	—	2	—	—	—
2	Local - -	328	1	—	1	8	7	14·39
3	In action - -	—	—	—	—	—	—	—
	No appreciable disease - -	2	—	—	—	—	—	·12
	Cause unknown (refers to deaths only). - -	—	—	—	—	—	—	—
	General total - -	4,002	37	8	45	335	102	225·20
	Average of 10 years, 1869–78	—	—	—	—	—	—	—

* The average ratios for 10 years will be given in future years. The ratios for the year 1879 will be given

HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the TROOPS
1,000 of the Strength, and the Average Ratios for 10 Years.*

Ratio per 1,000.					*Average Ratio per 1,000, from 18 to 18 .				
Admis- sions.	Deaths	Invalids sent Home.	Invalids finally Dis- charged.	Con- stantly Sick.	Admis- sions.	Deaths.	Invalids sent Home.	Invalids finally Dis- charged.	Con- stantly Sick.
1.1	—	—	—	.17	—	—	—	—	—
95.7	.89	2.21	—	4.89	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
292.3	3.32	34.10	—	10.63	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
1.1	—	—	—	.10	—	—	—	—	—
390.2	4.21	86.81	—	15.79	—	—	—	—	—
55.4	—	7.53	1.33	4.67	—	—	—	—	—
31.4	—	—	—	3.33	—	—	—	—	—
7.8	—	.22	.44	.49	—	—	—	—	—
6.4	1.33	4.87	4.43	.93	—	—	—	—	—
.7	—	—	—	.05	—	—	—	—	—
1.3	.22	—	—	.26	—	—	—	—	—
103.0	1.55	12.62	6.20	9.73	—	—	—	—	—
4.4	.44	.66	.22	.49	—	—	—	—	—
11.9	—	2.44	1.33	1.15	—	—	—	—	—
6.2	—	.66	.22	.31	—	—	—	—	—
.7	—	—	—	.03	—	—	—	—	—
8.0	1.11	2.66	1.77	.47	—	—	—	—	—
31.9	—	.66	—	2.94	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
38.8	1.77	5.31	1.55	3.56	—	—	—	—	—
67.5	—	3.54	3.32	4.04	—	—	—	—	—
36.5	—	—	—	1.57	—	—	—	—	—
9.1	—	—	—	.56	—	—	—	—	—
2.4	.22	—	—	.39	—	—	—	—	—
10.2	—	—	—	1.43	—	—	—	—	—
4.9	—	.89	1.11	.21	—	—	—	—	—
23.7	—	.22	.44	1.14	—	—	—	—	—
38.2	—	.22	—	1.39	—	—	—	—	—
16.2	—	6.20	4.87	.98	—	—	—	—	—
14.4	—	—	—	.46	—	—	—	—	—
—	.44	—	—	—	—	—	—	—	—
72.6	.22	1.77	1.55	3.19	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
.4	—	—	—	.03	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
886.2	9.96	74.16	22.58	49.86	—	—	—	—	—
643.3	6.57	28.84	17.43	33.96	—	—	—	—	—

in the Report for 1880, those for 1879 to 1880 in that for 1881, those for 1879 to 1881 in that for 1882, &c., &c.

ABSTRACT No. III.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into stationed at MALTA during the year 1879, with the Ratios per

Orders.	Average Strength, 4,668.		Admissions into Hospital.	Deaths.			Invalids.		Average Number constantly Sick.	
	Diseases.			In the Command.	Of Invalids.	Total.	Number sent Home.	Number finally Discharged the Service.		
	I.—General Diseases.									
	Febrile Group.									
	Eruptive Fevers - -	5	—	—	—	—	—	—	·44	
	Continued " - -	978	12	—	12	2	—	—	41·94	
	Yellow Fever - -	—	—	—	—	—	—	—	—	
	Paroxysmal Fevers - -	11	—	—	—	—	1	—	·46	
	Cholera - -	—	—	—	—	—	—	—	—	
	Other Diseases - -	85	—	—	—	—	—	—	1·53	
	Total - -	1,029	12	—	12	2	1	—	44·37	
	Constitutional Group.									
	Rheumatism - -	178	1	1	2	12	4	—	12·34	
	Primary Syphilis - -	175	—	—	—	—	—	—	11·75	
	Secondary " - -	28	—	—	—	3	1	—	3·40	
	Tubercular diseases - -	22	5	1	6	7	7	—	3·11	
	Scurvy and Purpura - -	—	—	—	—	—	—	—	·30	
	Other Diseases - -	17	—	—	—	3	1	—	1·59	
	Total - -	415	6	2	8	25	13	—	32·49	
	II.—Local Diseases.									
	Diseases of the—									
1	Nervous System - -	64	1	—	1	19	6	—	4·17	
2	Eye - -	94	—	—	—	10	7	—	6·03	
3	Ear - -	30	—	—	—	6	5	—	2·59	
4	Nose - -	9	—	—	—	—	—	—	·53	
5	Circulatory System - -	70	4	1	5	21	11	—	6·63	
6	Absorbent " - -	23	—	—	—	—	—	—	1·17	
7	Ductless glands - -	2	—	—	—	—	—	—	·15	
8	Respiratory System - -	188	5	—	5	12	4	—	14·34	
9	Digestive " - -	775	2	—	2	9	3	—	26·90	
10	Urinary System {	Gonorrhœa - -	180	—	—	—	—	—	9·26	
		Sequelæ of Gonorrh. - -	43	—	—	—	1	2	—	2·85
		Other diseases - -	17	—	—	—	1	1	—	1·28
11	Generative System - -	55	—	—	—	—	—	—	3·05	
12	Organs of Locomotion - -	31	—	—	—	4	2	—	2·09	
13	Cellular Tissue - -	125	—	—	—	—	—	—	7·11	
14	Cutaneous System - -	289	—	—	—	7	—	—	16·80	
	III.—Debility - -	98	—	—	—	35	10	—	7·65	
	IV.—Poisons - -	8	—	—	—	—	—	—	·19	
	V.—Injuries.									
1	General - -	9	5	—	5	—	—	—	·48	
2	Local - -	517	1	—	1	3	2	—	24·75	
3	In action - -	—	—	—	—	—	—	—	—	
	No appreciable disease - -	2	—	—	—	—	—	—	—	
	Cause unknown (refers to deaths only).	—	—	—	—	—	—	—	—	
	General total - -	4,073	36	3	39	155	67	—	216·98	
	Average of 10 years, 1869–78		—	—	—	—	—	—	—	

* The average ratios for 10 years will be given in future years. The ratios for the year 1879 will be given

HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the TROOPS 1,000 of the Strength, and the Average Ratios for 10 Years.*

Ratio per 1,000.					*Average Ratio per 1,000, from 18 to 18 .				
Admis- sions.	Deaths.	Invalids sent Home.	Invalids finally Dis- charged.	Con- stantly Sick.	Admis- sions.	Deaths.	Invalids sent Home.	Invalids finally Dis- charged.	Con- stantly Sick.
1.1	—	—	—	.09	—	—	—	—	—
209.5	2.57	.43	—	8.98	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
2.3	—	—	.21	.10	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
7.5	—	—	—	.33	—	—	—	—	—
220.4	2.57	.43	.21	9.50	—	—	—	—	—
37.1	.43	2.57	.86	2.64	—	—	—	—	—
37.5	—	—	—	2.52	—	—	—	—	—
6.0	—	.64	.21	.73	—	—	—	—	—
4.7	1.29	1.50	1.50	.67	—	—	—	—	—
—	—	—	—	.06	—	—	—	—	—
3.6	—	.64	.21	.34	—	—	—	—	—
88.9	1.72	5.35	2.78	6.96	—	—	—	—	—
13.7	.21	4.07	1.29	.89	—	—	—	—	—
20.1	—	2.14	1.50	1.29	—	—	—	—	—
6.4	—	1.29	1.07	.56	—	—	—	—	—
1.9	—	—	—	.11	—	—	—	—	—
15.0	1.07	4.50	2.36	1.42	—	—	—	—	—
4.9	—	—	—	.25	—	—	—	—	—
.4	—	—	—	.03	—	—	—	—	—
40.3	1.07	2.57	.86	3.07	—	—	—	—	—
166.0	.43	1.93	.64	5.76	—	—	—	—	—
38.6	—	—	—	2.01	—	—	—	—	—
9.2	—	.21	.43	.61	—	—	—	—	—
8.7	—	.21	.21	.28	—	—	—	—	—
11.8	—	—	—	.66	—	—	—	—	—
6.7	—	.86	.43	.45	—	—	—	—	—
26.8	—	—	—	1.52	—	—	—	—	—
61.9	—	1.50	—	4.03	—	—	—	—	—
21.0	—	7.50	2.14	1.64	—	—	—	—	—
1.7	—	—	—	.04	—	—	—	—	—
1.9	1.07	—	—	.10	—	—	—	—	—
110.8	.21	.64	.43	5.30	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
.4	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
872.5	8.35	33.20	14.35	46.48	—	—	—	—	—
816.0	9.90	28.61	18.24	41.28	—	—	—	—	—

in the Report for 1880, those for 1879 to 1880 in that for 1881, those for 1879 to 1881 in that for 1882, &c., &c.
Q 1913.

ABSTRACT No. IIIA.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into of the ROYAL MALTA FENCIBLE ARTILLERY during the Year 1879, with

Orders.	Average Strength, 347.		Deaths.			Invalids.		Average Number Constantly Sick.
	Diseases.	Admissions into Hospital.	In the Command.	Of Invalids.	Total.	Number sent Home.	Number finally Discharged the Service.	
	I.—General Diseases.							
	Febrile Group.							
	Eruptive Fevers - - -	—	—	—	—	—	—	—
	Continued „ - - -	32	—	—	—	—	—	·92
	Yellow Fever - - -	—	—	—	—	—	—	—
	Paroxysmal Fevers - - -	—	—	—	—	—	—	—
	Cholera - - -	—	—	—	—	—	—	—
	Other diseases - - -	—	—	—	—	—	—	—
	Total - - -	32	—	—	—	—	—	·92
	Constitutional Group.							
	Rheumatism - - -	6	—	—	—	—	3	·19
	Primary Syphilis - - -	4	—	—	—	—	—	·23
	Secondary „ - - -	8	—	—	—	—	—	·57
	Tubercular diseases - - -	6	1	—	1	—	1	·63
	Scurvy and Purpura - - -	—	—	—	—	—	—	—
	Other diseases - - -	1	—	—	—	—	—	·05
	Total - - -	25	1	—	1	—	4	1·67
	II.—Local Diseases.							
	Diseases of the—							
1	Nervous System - - -	1	—	—	—	—	1	·30
2	Eye - - -	10	—	—	—	—	2	·21
3	Ear - - -	1	—	—	—	—	—	·01
4	Nose - - -	—	—	—	—	—	—	—
5	Circulatory System - - -	1	1	—	1	—	5	·03
6	Absorbent „ - - -	1	—	—	—	—	—	·01
7	Ductless Glands - - -	—	—	—	—	—	—	—
8	Respiratory System - - -	17	—	—	—	—	1	·44
9	Digestive „ - - -	20	—	—	—	—	1	·57
10	Urinary { Gonorrhœa - - -	10	—	—	—	—	—	·38
	System { Sequelæ of Gonorrh. - - -	—	—	—	—	—	—	·06
	Other diseases - - -	—	—	—	—	—	—	—
11	Generative System - - -	2	—	—	—	—	—	·03
12	Organs of Locomotion - - -	—	—	—	—	—	—	—
13	Cellular Tissue - - -	3	—	—	—	—	—	·17
14	Cutaneous System - - -	29	—	—	—	—	1	·94
	III.—Debility		9	—	—	—	1	·59
	IV.—Poisons		—	—	—	—	—	—
	V.—Injuries.							
1	General - - -	—	—	—	—	—	—	—
2	Local - - -	45	—	—	—	—	—	1·13
3	In action - - -	—	—	—	—	—	—	—
	No appreciable disease - - -	—	—	—	—	—	—	—
	Cause unknown (refers to deaths only). - - -	—	—	—	—	—	—	—
	General total - - -	206	2	—	2	—	16	7·46
	Average of 10 years, 1869–78 - - -	—	—	—	—	—	—	—

* The average ratios for 10 years will be given in future years. The ratios for the year 1879 will be given

HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the TROOPS
the Ratios per 1,000 of the Strength, and the Average Ratios for 10 Years.*

Ratio per 1,000.					* Average Ratio per 1,000, from 18 to 18 .				
Admis- sions.	Deaths.	Invalids sent Home.	Invalids finally Dis- charged.	Con- stantly Sick.	Admis- sions.	Deaths.	Invalids sent Home.	Invalids finally Dis- charged.	Con- stantly Sick.
—	—	—	—	—	—	—	—	—	—
92·2	—	—	—	2·65	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
92·2	—	—	—	2·65	—	—	—	—	—
17·3	—	—	8·65	·55	—	—	—	—	—
11·5	—	—	—	·66	—	—	—	—	—
23·0	—	—	—	1·64	—	—	—	—	—
17·3	2·88	—	2·88	1·82	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
2·9	—	—	—	·14	—	—	—	—	—
72·0	2·88	—	11·53	4·81	—	—	—	—	—
2·9	—	—	2·88	·86	—	—	—	—	—
28·8	—	—	5·76	·61	—	—	—	—	—
2·9	—	—	—	·08	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
2·9	2·88	—	14·41	·09	—	—	—	—	—
2·9	—	—	—	·03	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
49·0	—	—	2·88	1·27	—	—	—	—	—
57·6	—	—	2·88	1·64	—	—	—	—	—
28·8	—	—	—	1·09	—	—	—	—	—
—	—	—	—	·17	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
5·8	—	—	—	·09	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
8·6	—	—	—	·49	—	—	—	—	—
88·5	—	—	2·88	2·71	—	—	—	—	—
25·9	—	—	2·88	1·70	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
129·7	—	—	—	3·26	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
593·5	5·76	—	46·10	21·50	—	—	—	—	—
764·4	5·71	—	—	—	—	—	—	—	—

in the Report for 1880, those for 1879 to 1880 in that for 1881, those for 1879 to 1881 in that for 1882, &c., &c.

ABSTRACT No. IV.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into stationed at CYPRUS during the Year 1879, with the Ratios per

Orders.	Average Strength, 660.		Admissions into Hospital.	Deaths.			Invalids.		Average Number Constantly Sick.
	Diseases.			In the Command.	Of Invalids.	Total.	Number sent Home.	Number finally Discharged the Service.	
	I.—General Diseases.								
	<i>Febrile Group.</i>								
	Eruptive Fevers	-	—	—	—	—	—	—	—
	Continued „	-	38	—	—	—	—	—	·97
	Yellow Fever	-	—	—	—	—	—	—	—
	Paroxysmal Fevers	-	344	4	3	7	11	4	10·09
	Cholera	-	—	—	—	—	—	—	—
	Other diseases	-	—	—	—	—	—	—	—
	Total	-	382	4	3	7	11	4	11·06
	<i>Constitutional Group.</i>								
	Rheumatism	-	25	—	—	—	—	1	1·42
	Primary Syphilis	-	24	—	—	—	—	—	1·46
	Secondary „	-	17	—	—	—	—	—	1·19
	Tubercular diseases	-	2	—	—	—	—	5	·26
	Scurvy and Purpura	-	—	—	—	—	—	—	—
	Other diseases	-	2	—	—	—	1	—	·49
	Total	-	70	—	—	—	1	6	4·82
	II.—Local Diseases.								
	Diseases of the—								
1	Nervous System	-	13	—	—	—	—	—	·32
2	Eye	-	42	—	—	—	2	2	·99
3	Ear	-	2	—	—	—	—	—	·08
4	Nose	-	—	—	—	—	—	—	—
5	Circulatory System	-	6	—	—	—	1	3	·34
6	Absorbent „	-	4	—	—	—	—	—	·24
7	Ductless Glands	-	—	—	—	—	—	—	—
8	Respiratory System	-	26	—	—	—	2	2	·57
9	Digestive „	-	181	4	—	4	1	—	6·07
10	Urinary { Gonorrhœa	-	39	—	—	—	—	4	2·13
	System { Sequelæ of Gonorr.	-	5	—	—	—	—	—	·50
	Other diseases	-	2	—	1	1	—	—	·10
11	Generative System	-	6	—	—	—	—	1	·16
12	Organs of Locomotion	-	7	—	—	—	1	—	·10
13	Cellular Tissue	-	20	—	—	—	1	1	1·11
14	Cutaneous System	-	53	—	—	—	2	—	1·54
	III.—Debility	-	12	—	—	—	3	14	·93
	IV.—Poisons	-	9	—	—	—	—	—	·20
	V.—Injuries.								
1	General	-	—	1	—	1	—	—	—
2	Local	-	91	1	—	1	—	2	4·44
3	In action	-	—	—	—	—	—	—	—
	No appreciable disease	-	—	—	—	—	—	—	—
	Cause unknown (refers to deaths only).	-	—	—	—	—	—	—	—
	General Total	-	970	10	4	14	25	39	35·70
	Average for 1878	-	—	—	—	—	—	—	—

* The average ratios for 10 years will be given in future years. The ratios for the year 1879 will be given

HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the TROOPS
1,000 of the Strength, and the Average Ratios for 10 Years.*

Ratio per 1,000.					*Average Ratio per 1,000, from 18 to 18 .				
Admis- sions.	Deaths.	Invalids sent Home.	Invalids finally Dis- charged.	Con- stantly Sick.	Admis- sions.	Deaths.	Invalids sent Home.	Invalids finally Dis- charged.	Con- stantly Sick.
—	—	—	—	—	—	—	—	—	—
57·6	—	—	—	1·47	—	—	—	—	—
521·2	10·61	16·67	6·06	15·29	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
578·8	10·61	16·67	6·06	16·76	—	—	—	—	—
37·9	—	—	1·51	2·15	—	—	—	—	—
36·4	—	—	—	2·21	—	—	—	—	—
25·8	—	—	—	1·81	—	—	—	—	—
3·0	—	—	7·57	·89	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
3·0	—	1·51	—	·74	—	—	—	—	—
106·1	—	1·51	9·08	7·30	—	—	—	—	—
19·7	—	—	—	·49	—	—	—	—	—
63·6	—	3·03	3·03	1·50	—	—	—	—	—
3·0	—	—	—	·12	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
9·1	—	1·51	4·55	·52	—	—	—	—	—
6·1	—	—	—	·86	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
39·4	—	3·03	3·03	·86	—	—	—	—	—
274·2	6·06	1·51	6·06	9·20	—	—	—	—	—
59·1	—	—	—	3·23	—	—	—	—	—
7·6	—	—	—	·76	—	—	—	—	—
3·0	1·51	—	1·51	·15	—	—	—	—	—
9·1	—	—	—	·24	—	—	—	—	—
10·6	—	1·51	1·51	·15	—	—	—	—	—
30·3	—	1·51	—	1·68	—	—	—	—	—
80·3	—	3·03	—	2·33	—	—	—	—	—
18·2	—	4·55	21·21	1·41	—	—	—	—	—
13·6	—	—	—	·30	—	—	—	—	—
—	1·51	—	—	—	—	—	—	—	—
137·9	1·51	—	3·03	6·78	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
1469·7	21·20	37·86	59·07	54·09	—	—	—	—	—
4397·1	40·27	151·01	21·25	—	—	—	—	—	—

in the Report for 1880, those for 1879 to 1880 in that for 1881, those for 1879 to 1881 in 1882, &c., &c.

ABSTRACT No. V.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into station in CANADA during the Year 1879, with the Ratios per

Orders.	Average Strength, 1,729.		Admis- sions into Hospital.	Deaths.			Invalids.		Average Number con- stantly Sick.
	Diseases.			In the Com- mand.	Of Inva- lids.	Total.	Number sent Home.	Number finally Dis- charged the Service.	
	I.—General Diseases.								
	<i>Febrile Group.</i>								
	Eruptive Fevers	-	—	—	—	—	—	—	—
	Continued "	-	6	—	—	—	—	—	·21
	Yellow Fever	-	—	—	—	—	—	—	—
	Paroxysmal Fevers	-	441	—	—	—	28	—	11·66
	Cholera	-	—	—	—	—	—	—	—
	Other Diseases	-	8	—	—	—	—	—	·30
	Total	-	455	—	—	—	28	—	12·17
	<i>Constitutional Group.</i>								
	Rheumatism	-	43	—	—	—	4	1	4·54
	Primary Syphilis	-	162	—	—	—	—	—	13·33
	Secondary "	-	67	—	—	—	—	1	5·13
	Tubercular diseases	-	10	2	—	2	4	5	1·83
	Scurvy and Purpura	-	—	—	—	—	—	—	—
	Other Diseases	-	2	1	—	1	—	1	·13
	Total	-	284	3	—	3	8	8	24·96
	II.—Local Diseases.								
	<i>Diseases of the—</i>								
1	Nervous System	-	12	—	—	—	2	1	1·81
2	Eye	-	22	—	—	—	1	2	·94
3	Ear	-	6	—	—	—	—	—	·43
4	Nose	-	—	—	—	—	—	—	—
5	Circulatory System	-	28	1	—	1	7	4	1·84
6	Absorbent "	-	53	—	—	—	—	—	4·43
7	Ductless Glands	-	—	—	—	—	—	—	—
8	Respiratory System	-	97	1	1	2	2	—	2·66
9	Digestive "	-	208	—	—	—	1	1	6·27
10	Urinary { Gonorrhœa	-	119	—	—	—	—	—	5·53
	System { Sequelæ of Gonorr.	-	16	—	—	—	—	1	1·02
	{ Other diseases	-	32	—	—	—	—	1	1·63
11	Generative System	-	18	—	—	—	—	1	1·55
12	Organs of Locomotion	-	2	—	—	—	1	1	·06
13	Cellular Tissue	-	20	—	—	—	—	—	·79
14	Cutaneous System	-	74	—	—	—	—	—	2·63
	III.—Debility	-	18	—	—	—	6	8	2·02
	IV.—Poisons	-	27	—	—	—	—	—	·90
	V.—Injuries.								
1	General	-	—	2	—	2	—	—	—
2	Local	-	201	—	—	—	1	1	7·14
3	In action	-	—	—	—	—	—	—	—
	No appreciable disease	-	9	—	—	—	—	—	·25
	Cause unknown (refers to deaths only).	-	—	—	—	—	—	—	—
	General total	-	1,701	7	1	8	57	24	79·03
	Average of 10 years, 1869–78	-	—	—	—	—	—	—	—

* The average ratios for 10 years will be given in future years. The ratios for the year 1879 will be given

HOSPITAL, DEATHS, NUMBERS INVALIDED AND CONSTANTLY SICK among the TROOPS
1,000 of the Strength, and the Average Ratios for 10 Years.*

Ratio per 1,000.					*Average Ratio per 1,000 from 18 to 18 .				
Admis- sions.	Deaths.	Invalids sent Home.	Invalids finally Dis- charged.	Con- stantly Sick.	Admis- sions.	Deaths.	Invalids sent Home.	Invalids finally Dis- charged.	Con- stantly Sick.
—	—	—	—	—	—	—	—	—	—
3·5	—	—	—	·12	—	—	—	—	—
255·1	—	16·19	—	6·74	—	—	—	—	—
4·6	—	—	—	·17	—	—	—	—	—
263·2	—	16·19	—	7·03	—	—	—	—	—
24·9	—	2·31	·58	2·62	—	—	—	—	—
93·7	—	—	—	7·71	—	—	—	—	—
38·7	—	—	·58	2·97	—	—	—	—	—
5·8	1·15	2·31	2·88	1·06	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
1·2	·58	—	·58	·07	—	—	—	—	—
164·3	1·73	4·62	4·62	14·43	—	—	—	—	—
6·9	—	1·15	·58	1·05	—	—	—	—	—
12·7	—	·58	1·15	·54	—	—	—	—	—
3·5	—	—	—	·25	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
16·2	·58	4·05	2·31	1·06	—	—	—	—	—
30·7	—	—	—	2·56	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
56·1	1·15	1·15	—	1·54	—	—	—	—	—
120·3	—	·58	·58	3·63	—	—	—	—	—
68·8	—	—	—	3·20	—	—	—	—	—
9·2	—	—	·58	·59	—	—	—	—	—
18·5	—	—	·58	·94	—	—	—	—	—
10·4	—	—	·58	·90	—	—	—	—	—
1·2	—	·58	·58	·03	—	—	—	—	—
11·6	—	—	—	·46	—	—	—	—	—
42·8	—	—	—	1·52	—	—	—	—	—
10·4	—	3·47	1·73	1·17	—	—	—	—	—
15·6	—	—	—	·52	—	—	—	—	—
—	1·15	—	—	—	—	—	—	—	—
116·2	—	·58	·58	4·13	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
5·2	—	—	—	·15	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
983·8	4·62	32·95	13·87	45·70	—	—	—	—	—
608·8	7·79	18·56	13·80	28·86	—	—	—	—	—

in the Report for 1880, those for 1879 to 1880 in that for 1881, those for 1879 to 1881 in that for 1882, &c., &c.

ABSTRACT No. VI.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into TROOPS stationed at BERMUDA during the Year 1879, with the Ratios

Orders.	Average Strength, 1,970.	Diseases.	Admissions into Hospital.	Deaths.			Invalids.		Average Number constantly Sick.
				In the Command.	Of Invalids.	Total.	Number sent Home.	Number finally Discharged the Service.	
		I. General Diseases.							
		<i>Febrile Group.</i>							
		Eruptive Fevers - - -	—	—	—	—	—	—	.12
		Continued „ - - -	62	2	—	2	—	—	3.18
		Yellow Fever - - -	—	—	—	—	—	—	—
		Paroxysmal Fevers - - -	—	—	—	—	—	—	—
		Cholera - - -	1	1	—	1	—	—	.02
		Other diseases - - -	7	—	—	—	—	—	.74
		Total - - -	70	3	—	3	—	—	4.06
		<i>Constitutional Group.</i>							
		Rheumatism - - -	42	—	—	—	1	2	2.63
		Primary Syphilis - - -	65	—	—	—	—	—	6.03
		Secondary „ - - -	21	—	—	—	—	2	1.11
		Tubercular diseases - - -	18	—	—	—	1	6	3.38
		Scurvy and Purpura - - -	1	—	—	—	—	—	.12
		Other diseases - - -	2	—	—	—	1	1	.27
		Total - - -	144	—	—	—	3	11	13.54
		II. Local Diseases.							
		<i>Diseases of the—</i>							
1		Nervous System - - -	16	1	—	1	—	2	1.31
2		Eye - - -	27	—	—	—	1	3	1.88
3		Ear - - -	15	—	—	—	1	1	1.23
4		Nose - - -	—	—	—	—	—	—	—
5		Circulatory System - - -	22	1	—	1	2	7	1.96
6		Absorbent „ - - -	61	—	—	—	1	—	5.87
7		Ductless Glands - - -	—	—	—	—	—	—	—
8		Respiratory System - - -	74	—	—	—	3	1	3.79
9		Digestive „ - - -	229	1	—	1	3	3	7.65
10		Urinary { Gonorrhœa - - -	49	—	—	—	—	—	2.93
		System { Sequelæ of Gonorrhœa - - -	11	—	—	—	1	—	2.09
		Other diseases - - -	20	—	—	—	—	—	1.76
11		Generative System - - -	17	—	—	—	—	—	.84
12		Organs of Locomotion - - -	5	—	—	—	—	1	.19
13		Cellular Tissue - - -	44	—	—	—	—	—	1.48
14		Cutaneous System - - -	110	—	—	—	1	1	3.93
		III.—Debility.	37	—	—	—	2	10	2.97
		IV.—Poisons - - -	15	1	—	1	—	—	.63
		V.—Injuries.							
1		General - - -	—	2	—	2	—	—	—
2		Local - - -	216	1	—	1	1	2	9.11
3		In action - - -	—	—	—	—	—	—	—
		No appreciable disease - - -	—	—	—	—	—	—	—
		Cause unknown (refers to deaths only).	—	—	—	—	—	—	—
		General Total - - -	1,175	10	—	10	19	42	67.22
		Average for 10 years, 1869–78	—	—	—	—	—	—	—

* The average ratios for 10 years will be given in future years. The ratios for the year 1879 will be given

HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the per 1,000 of the Strength, and the Average Ratios for 10 Years.*

Ratio per 1,000.					*Average Ratio per 1,000, from 18 to 18				
Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.	Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.
—	—	—	—	·06	—	—	—	—	—
31·5	1·01	—	—	1·61	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
·5	·51	—	—	·01	—	—	—	—	—
3·5	—	—	—	·38	—	—	—	—	—
35·5	1·52	—	—	2·06	—	—	—	—	—
21·3	—	·51	1·01	1·34	—	—	—	—	—
33·0	—	—	—	3·06	—	—	—	—	—
10·7	—	—	1·01	·56	—	—	—	—	—
6·6	—	·51	3·05	1·71	—	—	—	—	—
·5	—	—	—	·06	—	—	—	—	—
1·0	—	·51	·51	·14	—	—	—	—	—
73·1	—	1·52	5·58	6·87	—	—	—	—	—
8·1	·51	—	1·01	·67	—	—	—	—	—
13·7	—	·51	1·52	·96	—	—	—	—	—
7·6	—	·51	·51	·63	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
11·2	·51	1·01	3·55	·99	—	—	—	—	—
31·0	—	·51	—	2·98	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
37·6	—	1·52	·51	1·92	—	—	—	—	—
112·7	·51	1·52	1·52	3·88	—	—	—	—	—
24·9	—	—	—	1·49	—	—	—	—	—
5·6	—	·51	—	1·06	—	—	—	—	—
10·1	—	—	—	·89	—	—	—	—	—
8·6	—	—	—	·43	—	—	—	—	—
2·5	—	—	·51	·10	—	—	—	—	—
22·3	—	—	—	·75	—	—	—	—	—
55·8	—	·51	·51	1·99	—	—	—	—	—
18·8	—	1·01	5·08	1·51	—	—	—	—	—
7·6	·51	—	—	·32	—	—	—	—	—
—	1·01	—	—	—	—	—	—	—	—
109·7	·51	·51	1·01	4·62	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
596·4	5·08	9·64	21·31	34·12	—	—	—	—	—
668·1	10·43	21·75	12·59	33·12	—	—	—	—	—

in the Report for 1880, those for 1879 to 1880 in that for 1881, those for 1879 to 1881 in that for 1882, &c., &c.

ABSTRACT No. VII.—TABLE showing the AVERAGE STRENGTH, the ADMISSIONS into TROOPS stationed in the WEST INDIES, during the year 1879, with the

Orders.	Average Strength, 1,070.	Diseases.	Admissions into Hospital.	Deaths.			Invalids.		Average Number Constantly Sick.
				In the Command.	Of Invalids.	Total.	Number sent Home.	Number finally Discharged the Service.	
		I.—General Diseases.							
		<i>Febrile Group.</i>							
		Eruptive Fevers - - -	—	—	—	—	—	—	—
		Continued " - - -	132	—	—	2	—	—	3.90
		Yellow Fever - - -	—	—	—	—	—	—	—
		Paroxysmal Fevers - - -	20	—	—	1	4	—	2.96
		Cholera - - -	—	—	—	—	—	—	—
		Other Diseases - - -	1	—	—	—	—	—	.02
		Total - - -	153	—	—	3	4	—	6.88
		<i>Constitutional Group.</i>							
		Rheumatism - - -	49	—	—	—	—	—	2.18
		Primary Syphilis - - -	19	—	—	—	—	—	.65
		Secondary " - - -	8	—	—	—	1	—	.29
		Tubercular Diseases - - -	8	1	—	1	3	1	2.26
		Scurvy and Purpura - - -	—	—	—	—	—	—	—
		Other Diseases - - -	1	—	—	—	—	—	—
		Total - - -	85	1	—	1	4	1	5.38
		II.—Local Diseases.							
		Diseases of the—							
1		Nervous System - - -	17	2	—	2	10	4	2.45
2		Eye - - -	9	—	—	—	2	2	1.04
3		Ear - - -	10	—	—	—	2	2	.41
4		Nose - - -	—	—	—	—	—	—	—
5		Circulatory System - - -	5	—	—	—	1	1	.21
6		Absorbent " - - -	24	—	—	—	—	—	1.39
7		Ductless Glands - - -	—	—	—	—	—	—	—
8		Respiratory System - - -	19	1	—	1	—	—	2.24
9		Digestive " - - -	95	1	1	2	1	1	3.81
10		Urinary { Gonorrhœa - - -	30	—	—	—	—	—	1.19
		System { Sequelæ of Gonorrh. - - -	8	—	—	—	—	—	.95
		Other Diseases - - -	11	—	—	—	—	—	.15
11		Generative System - - -	12	—	—	—	—	—	.40
12		Organs of Locomotion - - -	9	—	—	—	—	—	.81
13		Cellular Tissue - - -	22	—	—	—	—	—	.51
14		Cutaneous System - - -	59	—	—	—	1	1	2.25
		III.—Debility - - -	14	—	—	—	4	4	1.74
		IV.—Poisons. - - -	2	—	—	—	—	—	—
		V.—Injuries.							
1		General - - -	—	—	—	—	—	—	—
2		Local - - -	102	2	—	2	—	—	3.10
3		in action - - -	—	—	—	—	—	—	—
		No appreciable disease - - -	—	—	—	—	—	—	—
		Cause unknown (refers to deaths only). - - -	—	—	—	—	—	—	—
		General total - - -	686	10	1	11	29	16	34.91
		Average for 10 years, 1869–78 - - -	—	—	—	—	—	—	—

* The average ratios for 10 years will be given in future years. The ratios for the year 1879 will be given

HOSPITAL, DEATHS, NUMBERS INVALIDED, and CONSTANTLY SICK among the WHITE
Ratios per 1,000 of the Strength, and the Average Ratios for 10 years.*

Ratio per 1,000.					* Average Ratio per 1,000, from 18 to 18 .				
Admis- sions.	Deaths.	Invalids sent Home.	Invalids finally Dis- charged.	Con- stantly Sick.	Admis- sions.	Deaths.	Invalids sent Home.	Invalids finally Dis- charged.	Con- stantly Sick.
—	—	—	—	—	—	—	—	—	—
123·4	1·87	—	—	3·64	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
18·7	·93	3·74	—	2·77	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
·9	—	—	—	·02	—	—	—	—	—
143·0	2·80	3·74	—	6·43	—	—	—	—	—
45·7	—	—	—	2·04	—	—	—	—	—
17·8	—	—	—	·61	—	—	—	—	—
7·5	—	·93	—	·27	—	—	—	—	—
7·5	·93	2·80	·93	2·11	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
·9	—	—	—	—	—	—	—	—	—
79·4	·93	3·74	·93	5·03	—	—	—	—	—
15·9	1·87	9·35	3·74	2·29	—	—	—	—	—
8·4	—	1·87	1·87	·97	—	—	—	—	—
9·3	—	1·87	1·87	·38	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
4·7	—	·93	·93	·20	—	—	—	—	—
22·4	—	—	—	1·30	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
17·8	·93	—	—	2·09	—	—	—	—	—
88·8	1·87	·93	·93	3·56	—	—	—	—	—
28·0	—	—	—	1·11	—	—	—	—	—
7·5	—	—	—	·89	—	—	—	—	—
10·3	—	—	—	·14	—	—	—	—	—
11·2	—	—	—	·37	—	—	—	—	—
8·4	—	—	—	·76	—	—	—	—	—
20·6	—	—	—	·48	—	—	—	—	—
55·1	—	·93	·93	2·10	—	—	—	—	—
13·1	—	3·74	3·74	1·63	—	—	—	—	—
1·9	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
95·3	1·87	—	—	2·90	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
641·1	10·27	27·10	14·94	32·63	—	—	—	—	—
911·0	11·47	19·32	11·63	41·93	—	—	—	—	—

in the Report for 1880, those for 1879 to 1880 in that for 1881, those for 1879 to 1881 in that for 1882, &c., &c.

ABSTRACT No. VIII.—TABLE showing the AVERAGE STRENGTH, the ADMISSIONS into TROOPS stationed in the WEST INDIES, during the year 1879, with the

Orders.	Average Strength, 1,138.		Admissions into Hospital.	Deaths.			Invalids.		Average Number constantly Sick.
	Diseases.			In the Command.	Of Invalids.	Total.	Number sent Home.	Number finally Discharged the Service.	
	I.—General Diseases.								
	Febrile Group.								
	Eruptive Fevers	-	—	—	—	—	—	—	·06
	Continued "	-	165	—	—	—	—	—	5·67
	Yellow Fever	-	—	—	—	—	—	—	—
	Paroxysmal Fevers	-	103	—	—	—	—	1	2·53
	Cholera	-	—	—	—	—	—	—	—
	Other diseases	-	1	—	—	—	—	—	—
	Total	-	269	—	—	—	—	1	8·26
	Constitutional Group.								
	Rheumatism	-	67	—	—	—	—	1	2·86
	Primary Syphilis	-	157	—	—	—	—	—	10·39
	Secondary "	-	42	—	—	—	—	3	4·20
	Tubercular Diseases	-	15	4	—	4	—	7	1·76
	Scurvy and Purpura	-	—	—	—	—	—	—	—
	Other diseases	-	4	—	—	—	—	—	·14
	Total	-	285	4	—	4	—	11	19·35
	II. Local Diseases.								
	Diseases of the—								
1	Nervous System	-	14	—	—	—	—	1	1·31
2	Eye	-	19	—	—	—	—	—	·31
3	Ear	-	4	—	—	—	—	—	·18
4	Nose	-	—	—	—	—	—	—	—
5	Circulatory System	-	12	6	—	6	—	3	1·15
6	Absorbent "	-	27	—	—	—	—	—	1·68
7	Ductless Glands	-	—	—	—	—	—	—	—
8	Respiratory System	-	94	2	—	2	—	1	5·55
9	Digestive "	-	93	4	—	4	—	1	5·08
10	Urinary { Gonorrhœa	-	166	—	—	—	—	—	7·04
	System { Sequelæ of Gonorrh.	-	41	—	—	—	—	—	3·50
	Other diseases	-	8	1	—	1	—	2	·38
11	Generative System	-	23	—	—	—	—	1	·68
12	Organs of Locomotion	-	12	—	—	—	—	3	·96
13	Cellular Tissue	-	82	—	—	—	—	—	2·39
14	Cutaneous System	-	79	—	—	—	—	2	3·75
	III.—Debility	-	14	—	—	—	—	2	·90
	IV.—Poisons	-	—	—	—	—	—	—	—
	V.—Injuries.								
1	General	-	—	1	—	1	—	—	—
2	Local	-	115	2	—	2	—	3	3·71
3	In action	-	—	—	—	—	—	—	—
	No appreciable disease	-	5	—	—	—	—	—	·43
	Cause unknown (refers to deaths only).	-	—	—	—	—	—	—	—
	General Total	-	1,312	20	—	20	—	3	66·56
	Average for 10 years, 1869-78		—	—	—	—	—	—	—

* The average ratios for 10 years will be given in future years. The ratios for the year 1879 will be given

HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the BLACK
 Ratios per 1,000 of the Strength, and the Average Ratios for 10 Years.*

Ratio per 1,000.					*Average Ratio per 1,000, from 18 to 18 .				
Admis- sions.	Deaths.	Invalids sent Home.	Invalids finally Dis- charged.	Con- stantly Sick.	Admis- sions.	Deaths.	Invalids sent Home.	Invalids finally Dis- charged.	Con- stantly Sick.
—	—	—	—	·05	—	—	—	—	—
145·0	—	—	—	4·98	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
90·5	—	—	·88	2·23	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
·9	—	—	—	—	—	—	—	—	—
236·4	—	—	·88	7·26	—	—	—	—	—
58·9	—	—	·88	2·51	—	—	—	—	—
137·9	—	—	—	9·13	—	—	—	—	—
36·9	—	—	2·63	3·69	—	—	—	—	—
13·2	3·51	—	6·15	1·55	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
3·5	—	—	—	·12	—	—	—	—	—
250·4	3·51	—	9·66	17·00	—	—	—	—	—
12·3	—	—	·88	1·15	—	—	—	—	—
16·7	—	—	—	·27	—	—	—	—	—
3·5	—	—	—	·11	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
10·5	5·27	—	2·63	1·01	—	—	—	—	—
23·7	—	—	—	1·48	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
82·6	1·76	—	·88	4·88	—	—	—	—	—
81·7	3·51	—	·88	4·46	—	—	—	—	—
145·9	—	—	—	6·19	—	—	—	—	—
36·0	—	—	—	3·08	—	—	—	—	—
7·1	·88	—	1·76	·33	—	—	—	—	—
20·2	—	—	·88	·60	—	—	—	—	—
10·5	—	—	2·63	·84	—	—	—	—	—
28·1	—	—	—	2·10	—	—	—	—	—
69·4	—	—	1·76	3·30	—	—	—	—	—
12·3	—	—	1·76	·79	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
—	·88	—	—	—	—	—	—	—	—
101·1	1·76	—	2·63	3·26	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
4·4	—	—	—	·38	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
1152·8	17·57	—	27·23	58·49	—	—	—	—	—
1047·3	19·42	—	—	54·90	—	—	—	—	—

in the Report for 1880, those for 1879 to 1880 in that for 1881, those for 1879 to 1881 in that for 1882, &c., &c.

ABSTRACT No. IX.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into TROOPS stationed at WEST AFRICA during the year 1879, with the

Orders.	Average Strength, 492.			Deaths.			Invalids.		Average Number constantly Sick.	
	Diseases.			Admissions into Hospital.	In the Command.	Of Invalids.	Total.	Number sent Home.		Number finally Discharged the Service.
	I.—General Diseases.									
	Febrile Group.									
	Eruptive Fevers	-	-	7	—	—	—	—	—	·29
	Continued „	-	-	1	—	—	—	—	—	·04
	Yellow Fever	-	-	—	—	—	—	—	—	—
	Paroxysmal Fevers	-	-	280	—	—	—	—	—	11·27
	Cholera	-	-	—	—	—	—	—	—	—
	Other Diseases	-	-	22	—	—	—	—	—	·89
	Total	-	-	310	—	—	—	—	—	12·49
	Constitutional Group.									
	Rheumatism	-	-	40	—	—	—	—	1	1·61
	Primary Syphilis	-	-	37	—	—	—	—	—	1·49
	Secondary „	-	-	39	—	—	—	—	4	1·57
	Tubercular disease	-	-	12	4	—	4	—	2	·48
	Scurvy and Purpura	-	-	—	—	—	—	—	—	—
	Other Diseases	-	-	2	1	—	1	—	—	·08
	Total	-	-	130	5	—	5	—	7	5·23
	II.—Local Diseases.									
	Diseases of the—									
1	Nervous System	-	-	11	—	—	—	—	2	·45
2	Eye	-	-	11	—	—	—	—	3	·45
3	Ear	-	-	6	—	—	—	—	—	·24
4	Nose	-	-	—	—	—	—	—	—	—
5	Circulatory System	-	-	22	—	—	—	—	6	·89
6	Absorbent „	-	-	8	—	—	—	—	—	·82
7	Ductless glands	-	-	—	—	—	—	—	—	—
8	Respiratory System	-	-	38	—	—	—	—	1	1·54
9	Digestive „	-	-	51	2	—	2	—	1	2·04
10	Urinary System	{	Gonorrhœa	50	—	—	—	—	—	2·00
			Sequelæ of Gonor.	7	—	—	—	—	—	·29
			Other diseases	1	—	—	—	—	—	·04
11	Generative System	-	-	10	—	—	—	—	—	·40
12	Organs of Locomotion	-	-	4	—	—	—	—	—	·16
13	Cellular Tissue	-	-	13	—	—	—	—	—	·52
14	Cutaneous System	-	-	53	—	—	—	—	—	2·13
	III.—Debility.			3	—	—	—	—	—	·13
	IV.—Poisons			1	—	—	—	—	—	·04
	V.—Injuries.									
1	General	-	-	1	—	—	—	—	—	·04
2	Local	-	-	48	—	—	—	—	1	1·94
3	In action	-	-	—	—	—	—	—	—	—
	No appreciable disease	-	-	1	—	—	—	—	—	·04
	Cause unknown (refers to deaths only).	-	-	—	—	—	—	—	—	—
	General total	-	-	779	7	—	7	—	21	31·88
	Average of 10 years, 1869–78	-	-	—	—	—	—	—	—	—

* The average ratios for 10 years will be given in future years. The ratios for the year 1879 will be given

HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the BLACK
 Ratios per 1,000 of the Strength, and the Average Ratios for 10 years.*

Ratio per 1,000.					*Average Ratio per 1,000, from 18 to 18 .				
Admis- sions.	Deaths.	Invalids sent Home.	Invalids finally Dis- charged.	Con- stantly Sick.	Admis- sions.	Deaths.	Invalids sent Home.	Invalids finally Dis- charged.	Con- stantly Sick.
14.2	—	—	—	.59	—	—	—	—	—
2.0	—	—	—	.08	—	—	—	—	—
569.1	—	—	—	22.91	—	—	—	—	—
44.7	—	—	—	1.80	—	—	—	—	—
630.1	—	—	—	25.38	—	—	—	—	—
81.3	—	—	2.03	3.27	—	—	—	—	—
75.2	—	—	—	3.03	—	—	—	—	—
79.3	—	—	8.13	3.19	—	—	—	—	—
24.4	8.13	—	4.06	.98	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
4.0	2.03	—	—	.16	—	—	—	—	—
264.2	10.16	—	14.22	10.63	—	—	—	—	—
22.4	—	—	4.06	.93	—	—	—	—	—
22.4	—	—	6.10	.93	—	—	—	—	—
12.2	—	—	—	.49	—	—	—	—	—
44.7	—	—	12.20	1.80	—	—	—	—	—
16.3	—	—	—	.65	—	—	—	—	—
77.2	—	—	2.03	3.14	—	—	—	—	—
103.7	4.06	—	2.03	4.15	—	—	—	—	—
101.6	—	—	—	4.06	—	—	—	—	—
14.2	—	—	—	.59	—	—	—	—	—
2.0	—	—	—	.08	—	—	—	—	—
20.3	—	—	—	.80	—	—	—	—	—
8.1	—	—	—	.33	—	—	—	—	—
26.4	—	—	—	1.04	—	—	—	—	—
107.7	—	—	—	4.32	—	—	—	—	—
6.1	—	—	—	.27	—	—	—	—	—
2.0	—	—	—	.08	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
99.6	—	—	2.03	4.03	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
2.0	—	—	—	.08	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
1583.3	14.22	—	42.67	63.78	—	—	—	—	—
1564.8	29.28	—	—	64.56	—	—	—	—	—

in the Report for 1880, those for 1879 to 1880 in that for 1881, those for 1879 to 1881 in that for 1882, &c., &c.

ABSTRACT No. X.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into station at the CAPE OF GOOD HOPE and ST. HELENA during the year 1879,

Orders.	Average Strength, 12,564.	Diseases.	Admis- sions into Hospital.	Deaths.			Invalids.		Average Number con- stantly Sick.
				In the Com- mand.	Of Inva- lids.	Total.	Number sent Home.	Number finally Dis- charged the Service.	
		I. General Diseases.							
		<i>Febrile Group.</i>							
		Eruptive Fevers - - -	15	—	—	—	1	—	83
		Continued „ - - -	2,684	217	1	218	252	—	154.58
		Yellow Fever - - -	—	—	—	—	—	—	—
		Paroxysmal Fevers - - -	828	24	—	24	96	—	48.08
		Cholera - - -	—	—	—	—	—	—	—
		Other Diseases - - -	28	1	—	1	1	—	1.51
		Total - - -	3,555	242	1	243	350	—	205.00
		<i>Constitutional Group.</i>							
		Rheumatism - - -	696	—	—	—	144	23	38.58
		Primary Syphilis - - -	212	—	—	—	—	—	11.80
		Secondary „ - - -	240	—	—	—	13	2	13.34
		Tubercular Diseases - - -	61	8	6	14	23	21	3.39
		Scurvy and Purpura - - -	9	—	—	—	1	—	.50
		Other Diseases - - -	36	2	—	2	5	—	2.00
		Total - - -	1,254	10	6	16	186	46	69.61
		II. Local Diseases.							
		<i>Diseases of the—</i>							
1		Nervous System - - -	166	8	—	8	41	9	9.23
2		Eye - - -	156	—	—	—	21	15	8.48
3		Ear - - -	43	—	—	—	9	1	2.39
4		Nose - - -	2	—	—	—	—	—	.11
5		Circulatory System - - -	281	10	1	11	135	59	15.67
6		Absorbent „ - - -	137	—	—	—	3	2	7.67
7		Ductless Glands - - -	—	—	—	—	—	—	—
8		Respiratory System - - -	508	29	1	30	41	12	27.71
9		Digestive „ - - -	2,742	87	3	90	202	44	157.10
10		Urinary { Gonorrhœa - - -	184	—	—	—	—	—	10.24
		System { Sequelæ of Gonorr. - - -	69	—	—	—	6	2	3.63
		{ Other diseases - - -	52	3	—	3	12	2	2.69
11		Generative System - - -	126	—	—	—	12	2	6.89
12		Organs of Locomotion - - -	81	2	—	2	15	9	4.50
13		Cellular Tissue - - -	265	—	—	—	7	2	14.92
14		Cutaneous System - - -	753	—	—	—	11	4	43.18
		III. Debility - - -	693	1	1	2	256	24	41.48
		IV. Poisons - - -	48	13	—	13	—	—	2.62
		V. Injuries.							
1		General - - -	3	19	2	21	—	—	} 51.96
2		Local - - -	948	2	—	2	37	15	
3		In action - - -	182	807	—	807	56	20	10.14
		No appreciable disease - - -	15	—	—	—	—	—	.83
		Cause unknown (refers to deaths only). - - -	—	—	—	—	—	—	—
		General total - - -	12,263	1,233	15	1,248	1,400	268	696.05
		Average of 10 years, 1869-78 - - -	—	—	—	—	—	—	—

* The average ratios for 10 years will be given in future years. The ratios for the year 1879 will be given

HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the TROOPS with the Ratios per 1,000 of the Strength, and the Average Ratios for 10 Years.*

Ratio per 1,000.					*Average Ratio per 1,000, from 18 to 18 .				
Admis- sions.	Deaths.	Invalids sent Home.	Invalids finally Dis- charged.	Con- stantly Sick.	Admis- sions.	Deaths.	Invalids sent Home.	Invalids finally Dis- charged.	Con- stantly Sick.
1.3	—	.08	—	.07	—	—	—	—	—
213.6	17.35	20.06	—	12.30	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
65.9	1.91	7.64	—	3.83	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
2.2	.08	.08	—	.12	—	—	—	—	—
282.9	19.34	27.86	—	16.32	—	—	—	—	—
55.4	—	11.46	1.83	3.07	—	—	—	—	—
16.9	—	—	—	.94	—	—	—	—	—
19.1	—	1.03	.16	1.06	—	—	—	—	—
4.8	1.11	1.83	1.67	.27	—	—	—	—	—
.7	—	.08	—	.04	—	—	—	—	—
2.9	.16	.40	—	.16	—	—	—	—	—
99.8	1.27	14.80	3.66	5.54	—	—	—	—	—
13.2	.64	3.26	.72	.73	—	—	—	—	—
12.4	—	1.67	1.19	.67	—	—	—	—	—
3.4	—	.72	.08	.19	—	—	—	—	—
.2	—	—	—	.01	—	—	—	—	—
22.4	.88	10.74	4.69	1.25	—	—	—	—	—
10.9	—	.24	.16	.61	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
40.4	2.39	3.26	.96	2.20	—	—	—	—	—
218.3	7.16	16.08	3.50	12.50	—	—	—	—	—
14.7	—	—	—	.81	—	—	—	—	—
5.5	—	.48	.16	.29	—	—	—	—	—
4.1	.24	.96	.16	.21	—	—	—	—	—
10.0	—	.96	.16	.55	—	—	—	—	—
6.5	.16	1.19	.72	.36	—	—	—	—	—
21.1	—	.56	.16	1.19	—	—	—	—	—
59.9	—	.88	.32	3.44	—	—	—	—	—
55.2	.16	20.37	1.91	3.30	—	—	—	—	—
3.8	1.03	—	—	.21	—	—	—	—	—
.2	1.67	—	—	} 4.14	—	—	—	—	—
75.5	.16	2.94	1.19		—	—	—	—	—
14.5	64.23	4.46	1.59		—	—	—	—	—
1.1	—	—	—		—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
976.0	99.33	111.43	21.33	55.40	—	—	—	—	—
940.8	11.72	19.80	14.50	45.37	—	—	—	—	—

in the report for 1880, those for 1879 to 1880 in that for 1881, those for 1879 to 1881 in that for 1882, &c., &c.

ABSTRACT No. XI.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into station at MAURITIUS during the Year 1879, with the Ratios per

Orders.	Average Strength, 348.		Admissions into Hospital.	Deaths.			Invalids.		Average Number constantly Sick.
	Diseases.			In the Command.	Of Invalids.	Total.	Number sent Home.	Number finally Discharged the Service.	
	I.—General Diseases.								
	<i>Febrile Group.</i>								
	Eruptive Fevers	-	—	—	—	—	—	—	—
	Continued „	-	40	1	—	1	—	—	1·15
	Yellow Fever	-	—	—	—	—	—	—	—
	Paroxysmal Fevers	-	542	—	—	—	12	—	10·90
	Cholera	-	—	—	—	—	—	—	—
	Other Diseases	-	—	—	—	—	—	—	—
	Total	-	582	1	—	1	12	—	12·05
	<i>Constitutional Group.</i>								
	Rheumatism	-	19	—	—	—	—	1	·90
	Primary Syphilis	-	54	—	—	—	—	—	2·67
	Secondary „	-	42	—	—	—	—	—	2·22
	Tubercular diseases	-	4	—	—	—	2	1	·54
	Scurvy and Purpura	-	—	—	—	—	—	—	—
	Other Diseases	-	—	—	—	—	—	—	—
	Total	-	119	—	—	—	2	2	6·33
	II.—Local Diseases.								
	<i>Diseases of the—</i>								
1	Nervous System	-	1	—	—	—	—	1	·12
2	Eye	-	3	—	—	—	—	1	·40
3	Ear	-	7	—	—	—	—	1	·70
4	Nose	-	—	—	—	—	—	—	—
5	Circulatory System	-	22	1	—	1	3	1	·68
6	Absorbent „	-	17	—	—	—	—	—	·89
7	Ductless Glands	-	—	—	—	—	—	—	—
8	Respiratory System	-	21	—	—	—	—	2	·75
9	Digestive „	-	89	5	—	5	2	1	2·40
	Urinary { Gonorrhœa	-	22	—	—	—	—	—	·77
10	System { Sequelæ of Gonorr.	-	5	—	—	—	—	1	·28
	Other diseases	-	11	1	—	1	1	—	1·67
11	Generative System	-	3	—	—	—	—	—	·80
12	Organs of Locomotion	-	1	—	—	—	—	1	·15
13	Cellular Tissue	-	14	—	—	—	—	—	·27
14	Cutaneous System	-	48	—	—	—	—	—	1·17
	III.—Debility	-	28	—	—	—	3	2	·89
	IV.—Poisons	-	1	1	—	1	—	—	·01
	V.—Injuries.								
1	General	-	—	—	—	—	—	—	—
2	Local	-	65	—	—	—	1	—	2·09
3	In action	-	—	—	—	—	—	—	—
	No appreciable disease	-	—	—	—	—	—	—	—
	Cause unknown (refers to deaths only).	-	—	—	—	—	—	—	—
	General total	-	1,059	9	—	9	24	13	32·42
	Average of 10 years, 1869–78	-	—	—	—	—	—	—	—

* The average ratios for 10 years will be given in future years. The ratios for the year 1879 will be given

**HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the TROOPS
1,000 of the Strength, and the Average Ratios for 10 Years.***

Ratio per 1,000.					*Average Ratio per 1,000 from 18 to 18 .				
Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.	Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.
—	—	—	—	—	—	—	—	—	—
114·9	2·87	—	—	3·30	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
1557·5	—	34·48	—	31·32	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
1672·4	2·87	34·48	—	34·62	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
54·6	—	—	2·87	2·59	—	—	—	—	—
155·2	—	—	—	7·67	—	—	—	—	—
120·7	—	—	—	6·38	—	—	—	—	—
11·5	—	5·75	2·87	1·55	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
342·0	—	5·75	5·75	18·19	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
2·9	—	—	2·87	·34	—	—	—	—	—
8·6	—	—	2·87	1·15	—	—	—	—	—
20·1	—	—	2·87	2·01	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
63·2	2·87	8·62	2·87	1·95	—	—	—	—	—
48·9	—	—	—	2·56	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
60·3	—	—	5·75	2·16	—	—	—	—	—
255·7	14·37	5·75	2·87	6·90	—	—	—	—	—
63·2	—	—	—	2·21	—	—	—	—	—
14·4	—	—	2·87	·80	—	—	—	—	—
31·6	2·87	2·87	—	4·80	—	—	—	—	—
8·6	—	—	—	2·30	—	—	—	—	—
2·9	—	—	2·87	·43	—	—	—	—	—
40·2	—	—	—	·78	—	—	—	—	—
137·9	—	—	—	3·36	—	—	—	—	—
80·5	—	8·62	5·75	2·56	—	—	—	—	—
2·9	2·87	—	—	·03	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
186·8	—	2·87	—	6·01	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
3043·1	25·85	68·96	37·34	93·16	—	—	—	—	—
1648·1	16·82	29·01	10·72	47·93	—	—	—	—	—

in the Report for 1880, those for 1879 to 1880 in that for 1881, those for 1879 to 1881 in that for 1882, &c., &c.

ABSTRACT No. XII.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into TROOPS stationed at CEYLON during the Year 1879, with the Ratios

Orders.	Average Strength, 881.	Diseases.	Admissions into Hospital.	Deaths.			Invalids.		Average Number constantly Sick.
				In the Command.	Of Invalids.	Total.	Number sent Home.	Number finally Discharged the Service.	
		I.—General Diseases.							
		<i>Febrile Group.</i>							
		Eruptive Fevers - -	—	—	—	—	—	—	—
		Continued „ - -	83	—	—	—	—	—	2·23
		Yellow Fever - -	—	—	—	—	—	—	—
		Paroxysmal Fevers - -	20	1	—	1	—	—	1·00
		Cholera - -	1	—	—	—	—	—	·01
		Other Diseases - -	14	—	—	—	—	—	·54
		Total - -	118	1	—	1	—	—	3·78
		<i>Constitutional Group.</i>							
		Rheumatism - -	27	—	—	—	—	—	·85
		Primary Syphilis - -	109	—	—	—	—	—	5·70
		Secondary „ - -	25	—	—	—	—	—	1·85
		Tubercular diseases - -	17	4	1	5	4	3	1·64
		Scurvy and Purpura - -	—	—	—	—	—	—	—
		Other Diseases - -	4	—	—	—	—	—	·22
		Total - -	182	4	1	5	4	3	10·26
		II.—Local Diseases.							
		<i>Diseases of the—</i>							
1		Nervous System - -	6	—	—	—	5	—	2·30
2		Eye - -	18	—	—	—	2	1	·85
3		Ear - -	7	—	—	—	—	—	·08
4		Nose - -	1	—	—	—	—	—	·01
5		Circulatory System - -	10	1	—	1	—	2	·35
6		Absorbent „ - -	52	—	—	—	—	—	5·84
7		Ductless Glands - -	—	—	—	—	—	—	—
8		Respiratory System - -	29	2	—	2	—	—	1·32
9		Digestive „ - -	246	6	1	7	10	1	11·36
10		Urinary { Gonorrhœa - -	58	—	—	—	—	—	2·18
		System { Sequelæ of Gonorr. - -	17	—	—	—	—	—	1·10
		Other diseases - -	11	—	—	—	—	—	·35
11		Generative System - -	11	—	—	—	—	—	·26
12		Organs of Locomotion - -	5	—	—	—	1	1	·97
13		Cellular Tissue - -	35	—	—	—	1	1	·99
14		Cutaneous System - -	123	—	—	—	1	2	3·54
		III.—Debility - -	7	—	—	—	—	2	·27
		IV.—Poisons - -	7	—	—	—	—	—	·16
		V.—Injuries.							
1		General - -	—	1	—	1	1	1	—
2		Local - -	102	—	—	—	—	—	3·57
3		In action - -	—	—	—	—	—	—	—
		No appreciable disease - -	1	—	—	—	—	—	·01
		Cause unknown (refers to deaths only). - -	—	—	—	—	—	—	—
		General total - -	1,041	15	2	17	25	14	49·55
		Average of 10 years, 1869–78	—	—	—	—	—	—	—

* The average ratios for 10 years will be given in future years. The ratios for the year 1879 will be given

HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the WHITE per 1,000 of the Strength, and the Average Ratios for 10 Years.*

Ratio per 1,000.					*Average Ratio per 1,000, from 18 to 18				
Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.	Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.
—	—	—	—	—	—	—	—	—	—
94.2	—	—	—	2.53	—	—	—	—	—
22.7	1.14	—	—	1.14	—	—	—	—	—
1.1	—	—	—	.01	—	—	—	—	—
15.9	—	—	—	.61	—	—	—	—	—
183.9	1.14	—	—	4.29	—	—	—	—	—
30.7	—	—	—	.96	—	—	—	—	—
123.7	—	—	—	6.47	—	—	—	—	—
28.4	—	—	—	2.10	—	—	—	—	—
19.3	5.67	4.54	3.40	1.86	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
4.5	—	—	—	.25	—	—	—	—	—
206.6	5.67	4.54	3.40	11.64	—	—	—	—	—
6.8	—	5.67	—	2.61	—	—	—	—	—
20.4	—	2.27	1.14	.96	—	—	—	—	—
7.9	—	—	—	.09	—	—	—	—	—
1.1	—	—	—	.01	—	—	—	—	—
11.4	1.14	—	2.27	.40	—	—	—	—	—
59.0	—	—	—	6.63	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
32.9	2.27	—	—	1.50	—	—	—	—	—
279.2	7.94	11.35	1.14	12.89	—	—	—	—	—
60.2	—	—	—	2.47	—	—	—	—	—
19.3	—	—	—	1.25	—	—	—	—	—
12.5	—	—	—	.40	—	—	—	—	—
12.5	—	—	—	.29	—	—	—	—	—
5.7	—	1.14	1.14	1.01	—	—	—	—	—
39.7	—	1.14	1.14	1.24	—	—	—	—	—
139.6	—	1.14	2.27	4.02	—	—	—	—	—
7.9	—	—	2.27	.30	—	—	—	—	—
7.9	—	—	—	.18	—	—	—	—	—
—	1.14	1.14	1.14	—	—	—	—	—	—
115.8	—	—	—	4.05	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
1.1	—	—	—	.01	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
1181.4	19.30	28.39	15.91	56.24	—	—	—	—	—
1010.8	15.97	36.36	15.47	50.02	—	—	—	—	—

in the Report for 1880, those for 1879 to 1880 in that for 1881, those for 1879 to 1881 in that for 1882, &c., &c.

ABSTRACT No. XIII.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into TROOPS stationed in CHINA and the STRAITS SETTLEMENTS, during the Year 1879,

Orders.	Average Strength, 1,876.		Deaths.			Invalids.		Average Number constantly Sick.
	Diseases.	Admissions into Hospital.	In the Command.	Of Invalids.	Total.	Number sent Home.	Number finally Discharged the Service.	
	I. General Diseases.							
	<i>Febrile Group.</i>							
	Eruptive Fevers - -	14	—	—	—	—	—	·36
	Continued „ - -	134	1	—	1	—	—	4·22
	Yellow Fever - -	—	—	—	—	—	—	—
	Paroxysmal Fevers - -	99	—	—	—	—	—	3·24
	Cholera - -	—	—	—	—	—	—	—
	Other Diseases - -	5	—	—	—	—	—	·27
	Total - -	252	1	—	1	—	—	8·09
	<i>Constitutional Group.</i>							
	Rheumatism - -	36	—	—	—	—	—	1·72
	Primary Syphilis - -	156	—	—	—	—	—	11·80
	Secondary „ - -	21	—	—	—	1	2	1·69
	Tubercular diseases - -	68	—	1	1	40	13	9·59
	Scurvy and Purpura - -	—	—	—	—	—	—	—
	Other Diseases - -	1	2	—	2	—	—	·01
	Total - -	282	2	1	3	41	15	24·74
	II.—Local Diseases.							
	<i>Diseases of the—</i>							
1	Nervous System - -	26	4	—	4	5	—	2·19
2	Eye - -	31	—	—	—	3	1	2·18
3	Ear - -	10	—	—	—	—	—	·45
4	Nose - -	1	—	—	—	—	—	·01
5	Circulatory System - -	63	—	—	—	14	6	5·60
6	Absorbent „ - -	62	—	—	—	—	—	5·30
7	Ductless Glands - -	—	—	—	—	—	—	—
8	Respiratory System - -	87	—	—	—	4	—	6·05
9	Digestive System - -	251	3	1	4	2	—	13·94
10	Urinary { Gonorrhœa - -	187	—	—	—	—	—	11·03
	System { Sequelæ of Gonorrh. - -	40	—	—	—	—	—	1·92
	{ Other diseases - -	13	—	1	1	1	—	1·03
11	Generative system - -	32	—	—	—	—	—	1·49
12	Organs of Locomotion - -	2	—	—	—	—	1	·49
13	Cellular Tissue - -	37	—	—	—	—	—	2·64
14	Cutaneous System - -	98	—	—	—	—	—	4·13
	III.—Debility.	50	—	—	—	4	3	2·71
	IV.—Poisons.	14	—	—	—	—	—	·35
	V.—Injuries.							
1	General - -	—	—	—	—	—	—	—
2	Local - -	200	—	—	—	1	1	5·65
3	In action - -	—	—	—	—	—	—	—
	No appreciable disease - -	4	—	—	—	—	—	·15
	Cause unknown (refers to deaths only). - -	—	—	—	—	—	—	—
	General total - -	1,742	10	3	13	75	27	100·07
	Average of 10 years, 1869–78	—	—	—	—	—	—	—

* The average ratios for 10 years will be given in future years. The ratios for the year 1879 will be given

HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the WHITE with the Ratios per 1,000 of the Strength, and the Average Ratios for 10 Years.*

Ratio per 1,000.					*Average Ratio per 1,000 from 18 to 18 .				
Admis- sions.	Deaths.	Invalids sent Home.	Invalids finally Dis- charged.	Con- stantly Sick.	Admis- sions.	Deaths.	Invalids sent Home.	Invalids finally Dis- charged.	Con- stantly Sick.
7.5	—	—	—	.19	—	—	—	—	—
71.4	.58	—	—	2.25	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
52.8	—	—	—	1.73	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
2.6	—	—	—	.14	—	—	—	—	—
134.3	.53	—	—	4.31	—	—	—	—	—
19.2	—	—	—	.92	—	—	—	—	—
83.2	—	—	—	6.29	—	—	—	—	—
11.2	—	.53	1.07	.86	—	—	—	—	—
36.2	.53	21.32	6.93	5.11	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
.5	1.07	—	—	.01	—	—	—	—	—
150.3	1.60	21.85	8.00	13.19	—	—	—	—	—
13.9	2.13	2.67	—	1.17	—	—	—	—	—
16.5	—	1.60	.53	1.16	—	—	—	—	—
5.3	—	—	—	.24	—	—	—	—	—
.5	—	—	—	.01	—	—	—	—	—
33.6	—	7.46	3.20	2.99	—	—	—	—	—
33.0	—	—	—	2.83	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
46.4	—	2.13	—	3.22	—	—	—	—	—
133.8	2.13	1.07	—	7.43	—	—	—	—	—
99.7	—	—	—	5.88	—	—	—	—	—
21.3	—	—	—	1.02	—	—	—	—	—
6.9	.53	.53	—	.55	—	—	—	—	—
17.1	—	—	—	.79	—	—	—	—	—
1.1	—	—	.53	.22	—	—	—	—	—
19.7	—	—	—	1.41	—	—	—	—	—
52.2	—	—	—	2.20	—	—	—	—	—
26.7	—	2.18	1.60	1.44	—	—	—	—	—
7.5	—	—	—	.19	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
106.6	—	.53	.53	3.01	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
2.1	—	—	—	.08	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
928.5	6.92	39.97	14.39	53.34	—	—	—	—	—
1280.6	14.82	46.70	22.51	50.35	—	—	—	—	—

In the Report for 1880, those for 1879 to 1880 in that for 1881, those for 1879 to 1881 in that for 1882, &c., &c.

ABSTRACT No. XIV.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into stations in the BENGAL PRESIDENCY during the Year 1879, with the

Orders.	Average Strength, 29,129.	Diseases.	Admissions into Hospital.	Deaths.			Invalids.		Average Number Constantly Sick.†
				In the Command.	Of Invalids.	Total.	Number sent Home.	Number finally Discharged the Service.	
		I.—General Diseases.							
		<i>Febrile Group.</i>							
		Eruptive Fevers - - -	123	3	—	3	—	—	—
		Continued „ - - -	4,908	118	—	118	1	—	—
		Yellow Fever - - -	—	—	—	—	—	—	—
		Paroxysmal Fevers - -	25,154	75	—	75	172	4	—
		Cholera - - -	281	241	—	241	4	—	—
		Other diseases - - -	87	3	1	4	—	—	—
		Total - - -	30,553	440	1	441	177	4	—
		<i>Constitutional Group.</i>							
		Rheumatism - - -	1,122	2	—	2	49	43	—
		Primary Syphilis - -	2,240	—	—	—	1	—	—
		Secondary „ - - -	808	2	1	3	39	25	—
		Tubercular Diseases -	202	33	26	59	60	49	—
		Scurvy and Purpura -	22	—	—	—	—	—	—
		Other diseases - - -	94	4	1	5	32	7	—
		Total - - -	4,488	41	28	69	181	124	—
		II.—Local Diseases.							
		Diseases of the—							
1		Nervous System - - -	638	109	6	115	93	31	—
2		Eye - - -	488	—	—	—	21	18	—
3		Ear - - -	284	—	—	—	13	18	—
4		Nose - - -	23	—	—	—	2	1	—
5		Circulatory System -	476	23	1	24	107	92	—
6		Absorbent „ - - -	467	—	—	—	2	3	—
7		Ductless Glands - -	5	1	—	1	1	—	—
8		Respiratory System -	1,756	46	3	49	39	23	—
9		Digestive „ - - -	7,772	156	11	167	232	110	—
10		Urinary { Gonorrhœa - -	3,846	—	—	—	—	—	—
		System { Sequelæ of Gonorr. -	403	—	—	—	—	10	—
		Other diseases - - -	404	8	—	8	16	4	—
11		Generative System -	402	1	—	1	5	5	—
12		Organs of Locomotion -	133	2	2	4	22	19	—
13		Cellular Tissue - - -	482	—	—	—	4	2	—
14		Cutaneous System - -	2,200	—	—	—	12	13	—
		III.—Debility - - -	1,290	5	—	5	318	236	—
		IV.—Poisons - - -	110	12	—	12	—	—	—
		V.—Injuries.							
1		General - - -	31	15	—	15	—	—	—
2		Local - - -	2,555	23	—	23	24	16	—
3		In action - - -	—	—	—	—	3	1	—
		No appreciable disease -	24	—	—	—	—	—	—
		Cause unknown (refers to deaths only).	—	—	—	—	—	—	—
		General Total - - -	58,830	882	52	934	1,272	730	2231.18
		Average of 10 years, 1869–78	—	—	—	—	—	—	—

* The average ratios for 10 years will be given in future years. The ratios for the year 1879 will be given
† The average numbers constantly sick by classes and orders

HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the TROOPS
Ratio per 1,000 of the Strength, and the Average Ratios for 10 Years.*

Ratio per 1,000.					*Average Ratio per 1,000, from 18 to 18 .				
Admis- sions.	Deaths.	Invalids sent Home.	Invalids finally Dis- charged.	Con- stantly Sick.	Admis- sions.	Deaths.	Invalids sent Home.	Invalids finally Dis- charged.	Con- stantly Sick.
4·2	·10	—	—	—	—	—	—	—	—
168·5	4·05	·03	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
863·5	2·58	5·91	·14	—	—	—	—	—	—
9·6	8·27	·14	—	—	—	—	—	—	—
3·0	·14	—	—	—	—	—	—	—	—
1048·8	15·14	6·08	·14	—	—	—	—	—	—
88·5	·07	1·68	1·48	—	—	—	—	—	—
76·9	—	·03	—	—	—	—	—	—	—
27·7	·10	1·34	·86	—	—	—	—	—	—
6·9	2·03	2·06	1·68	—	—	—	—	—	—
·8	—	—	—	—	—	—	—	—	—
3·2	·17	1·10	·24	—	—	—	—	—	—
134·0	2·37	6·21	4·26	—	—	—	—	—	—
21·9	8·95	3·19	1·06	—	—	—	—	—	—
16·8	—	·72	·62	—	—	—	—	—	—
9·8	—	·45	·62	—	—	—	—	—	—
·8	—	·07	·03	—	—	—	—	—	—
16·3	·82	3·67	3·16	—	—	—	—	—	—
16·0	—	·07	·10	—	—	—	—	—	—
·2	·03	·03	—	—	—	—	—	—	—
60·3	1·68	1·34	·79	—	—	—	—	—	—
266·8	5·73	7·97	3·78	—	—	—	—	—	—
132·0	—	—	—	—	—	—	—	—	—
13·8	—	—	·34	—	—	—	—	—	—
13·9	·28	·55	·14	—	—	—	—	—	—
13·8	·03	·17	·17	—	—	—	—	—	—
4·6	·14	·75	·65	—	—	—	—	—	—
16·6	—	·14	·07	—	—	—	—	—	—
75·5	—	·41	·45	—	—	—	—	—	—
44·3	·17	10·92	8·10	—	—	—	—	—	—
3·8	·41	—	—	—	—	—	—	—	—
1·1	·52	—	—	—	—	—	—	—	—
87·7	·79	·82	·55	—	—	—	—	—	—
—	—	·10	·03	—	—	—	—	—	—
·8	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
2019·6	32·06	43·66	25·06	76·60	—	—	—	—	—
1466·3	21·58	42·01	15·45	57·26	—	—	—	—	—

in the Report for 1880, those for 1879 to 1880 in that for 1881, those for 1879 to 1881 in that for 1882, &c., &c.
have not been received up to the time of going to press.

ABSTRACT No. XV.—TABLE, taken from the REPORTS of the PRINCIPAL
at the CHIEF STATIONS

Stations.				Average Annual Strength.	Admitted into Hospital.
Presidency	Calcutta	-	-	706	590
	Barrackpore	-	-	239	534
	Dum-Dum	-	-	354	735
	Hazaribagh	-	-	111	120
	Darjeeling	-	-	109	78
Allahabad	Allahabad	-	-	899	1,447
	Fort Allahabad	-	-	139	285
	Dinapore	-	-	834	1,193
	Benares	-	-	465	1,082
	Chunar	-	-	68	304
Oudh	Cawnpore	-	-	981	2,180
	Lucknow	-	-	1,963	2,980
	Fyzabad	-	-	419	603
	Sitapur	-	-	229	262
	Bareilly	-	-	729	980
Rohilcund	Shahjehanpur	-	-	231	440
	Moradabad	-	-	185	522
	Ranikhet	-	-	121	157
	Choubatia	-	-	336	370
	Saugor	-	-	300	475
Saugor	Jubbulpore	-	-	356	405
	Nowgong	-	-	286	425
	Morar	-	-	1,046	2,380
	Fortress Gwalior	-	-	361	573
	Jhansi	-	-	369	778
Gwalior	Meerut	-	-	904	1,662
	Fatehgarh	-	-	142	363
	Agra	-	-	763	1,715
	Muttra	-	-	421	1,224
	Delhi	-	-	418	1,935
Meerut	Roorkee	-	-	322	405
	Chakrata	-	-	83	136
	Umballa	-	-	1,010	2,229
	Jullundur	-	-	204	623
	Subathu	-	-	334	661
Sirhind	Dagshai	-	-	452	503
	Jutogh	-	-	36	29
	Solon	-	-	188	218
	Meean Meer	-	-	993	4,073
	Fort Lahore	-	-	120	393
Lahore	Amritsar	-	-	154	737
	Fort Govindgarh	-	-	82	172
	Ferozepore	-	-	918	1,987
	Mooltan	-	-	719	975
	Fort Kangra	-	-	61	292
Rawal Pindi	Rawal Pindi	-	-	1,431	3,752
	Campbellpore	-	-	56	158
	Sialkot	-	-	725	1,596
	Dera Ismail Khan	-	-	107	397
	Fort Attock	-	-	174	456
Rawal Pindi	Kooldunna	-	-	120	246
	Khyra Gully	-	-	25	59
	Bara Gully	-	-	73	173
	Cherealla	-	-	167	329
	Kala Bagh	-	-	131	321
Peshawur	Hussan Abdal	-	-	55	66
	Peshawur	-	-	957	2,561
	Nowshera	-	-	610	1,287
	Hoti Murdan	-	-	46	249
	Troops marching	-	-	1,236	1,488
Hill depôts and other hospitals				3,056	5,477

* 1 year only.

† 9 years only.

‡ 8 years only.

MEDICAL OFFICER, showing the ADMISSIONS and DEATHS which took place in the BENGAL COMMAND.

Died in India.	Ratio per 1,000 of Strength.		Ratio per 1,000 of Strength, 1869-78.	
	Admitted.	Died.	Admitted.	Died.
4	836	5.67	1092.4	12.60
3	2,234	12.55	1930.9	23.02
5	2,076	14.13	1122.3	17.22
—	1,081	—	1095.1	15.95
—	716	—	990.3	13.91
13	1,610	14.46	1663.2	36.02
1	2,050	7.19	*1328.9	52.63
12	1,430	14.39	1470.7	21.00
13	2,327	27.96	1526.6	21.64
2	4,471	29.41	†2232.3	36.20
24	2,222	24.46	1553.5	22.33
39	1,518	19.87	1318.8	23.48
2	1,439	4.77	1281.1	27.18
7	1,144	30.57	1195.3	15.81
4	1,344	5.49	1029.8	13.05
4	1,905	17.32	1059.1	16.10
3	2,822	16.22	949.5	16.85
—	1,298	—	‡922.1	12.25
1	1,101	2.98	—	—
3	1,583	10.00	1701.1	28.62
2	1,138	5.62	1408.0	23.45
4	1,486	13.99	1691.4	24.71
53	2,275	50.67	1474.6	28.31
8	1,587	22.16	1247.8	24.76
6	2,108	16.26	2451.3	15.59
21	1,838	23.23	1697.6	25.00
—	2,556	—	1279.2	13.55
17	2,248	22.28	1243.9	17.22
21	2,907	49.88	1098.2	16.23
10	4,629	23.92	2014.3	25.72
3	1,258	9.32	1316.3	17.73
5	1,639	60.24	755.8	9.23
18	2,207	17.82	1444.7	16.05
7	3,054	34.31	1644.4	20.87
15	1,982	44.91	996.2	15.85
8	1,113	17.70	1006.0	11.27
—	806	—	839.6	16.82
3	1,133	15.96	§1071.1	14.22
42	4,102	42.30	2605.6	34.71
3	3,275	25.00	†2199.3	36.25
2	4,786	12.99	‡2340.6	26.19
1	2,098	12.20	1914.4	17.53
12	2,164	13.07	1476.7	16.69
12	1,356	16.69	1671.4	16.03
5	4,787	81.97	1897.9	15.71
47	2,622	32.84	1494.9	14.06
1	2,821	17.86	1428.8	16.47
59	2,201	81.88	1491.3	16.05
4	3,710	37.38	2184.8	17.89
14	2,621	80.46	2127.8	20.68
14	2,050	116.67	¶979.3	7.31
6	2,860	240.00	¶1261.9	10.18
—	2,370	—	¶1155.2	10.83
8	1,970	47.90	—	—
1	2,450	7.63	¶1703.3	7.97
—	1,200	—	—	—
70	2,676	73.15	2692.4	36.00
30	2,110	49.18	2163.5	17.13
—	5,413	—	—	—
70	1,204	56.63	962.2	12.51
160	1,792	52.36	1607.9	32.05

§ 5 years only.

|| 7 years only.

¶ 6 years only.

ABSTRACT XVI.—TABLE, taken from the PRINCIPAL MEDICAL OFFICER'S CLASSES OF DISEASES in each of the MILITARY DIVISIONS in

Order.	Military Divisions.	Pre-sidency.		Allaha-bad.		Oudh.		Rohil-cund.		Saugor.	
	Average Annual Strength.	1,426		3,374		2,702		1,713		941	
	Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
	I. General Diseases.										
	<i>Febrile Group.</i>										
	Eruptive Fevers	1	—	2	1	4	1	—	—	2	—
	Continued "	374	1	711	9	734	13	183	3	44	—
	Yellow Fever	—	—	—	—	—	—	—	—	—	—
	Paroxysmal Fevers	399	2	1,000	6	628	5	617	2	459	1
	Cholera	1	—	10	4	2	—	—	—	3	—
	Other Diseases	7	—	2	—	13	1	1	—	3	—
	Total	782	3	2,634	20	1,381	20	801	5	508	1
	<i>Constitutional Group.</i>										
	Rheumatism	42	—	142	—	82	—	117	—	31	—
	Primary Syphilis	104	—	469	—	181	—	182	—	86	—
	Secondary "	26	—	121	—	67	1	90	—	50	—
	Tubercular Diseases	8	1	31	4	22	3	17	2	5	1
	Scurvy and Purpura	—	—	2	1	—	—	—	—	3	—
	Other diseases	4	1	1	—	12	1	17	—	4	—
	Total	184	2	766	5	364	5	423	2	179	1
	II. Local Diseases.										
	Diseases of the—										
1	Nervous System	21	1	75	16	70	8	24	4	21	4
2	Eye	23	—	78	—	73	—	31	—	15	—
3	Ear	15	—	30	—	46	—	20	—	7	—
4	Nose	—	—	1	—	2	—	1	—	—	—
5	Circulatory System	44	1	68	—	57	—	49	—	4	1
6	Absorbent "	18	—	136	—	41	—	19	—	13	—
7	Ductless Glands	—	—	1	—	—	—	3	1	—	—
8	Respiratory System	33	—	152	1	113	2	50	—	33	1
9	Digestive "	355	3	886	20	655	8	294	4	187	—
10	Urinary (Gonorrhoea	219	—	569	—	326	—	345	—	138	—
	System. (Sequelae of Gonorrhoea	22	—	64	—	32	—	26	—	5	—
	System. (Other Diseases	33	—	54	2	24	—	41	1	4	—
11	Generative System	26	—	44	—	41	—	17	—	23	—
12	Organs of Locomotion	8	—	12	—	9	—	10	—	4	—
13	Cellular Tissue	17	—	70	—	48	—	36	—	13	—
14	Cutaneous System	106	—	267	—	334	—	128	—	63	—
	III. Debility	62	1	120	—	79	—	63	—	25	—
	IV. Poisons	7	1	19	1	3	—	4	—	1	—
	V. Injuries.										
	General	1	1	2	2	1	4	2	—	—	—
	Local	113	1	307	5	259	2	136	1	67	2
	In action	—	—	—	—	—	—	—	—	—	—
	Surgical Operations	1	—	2	—	—	—	—	—	1	—
	No appreciable Disease	1	—	4	—	2	—	5	—	—	—
	Cause unknown (refers to deaths only)	—	—	—	—	—	—	—	—	—	—
	General total	2,121	14	6,370	72	3,960	49	2,623	18	1,311	10

REPORT, showing the PREVALENCE and MORTALITY of the DIFFERENT the BENGAL COMMAND with the ratios per 1,000 of Strength.

Gwallior.		Meerut.		Sirhind.		Lahore.		Rawal Pindi.		Peshawar.		Troops on the March.		Field Service.		Hill Depôts.	
1,773		3,282		2,427		3,165		3,573		1,861		1,540		9,613		1,413	
Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
1	—	73	—	13	—	12	1	13	—	5	—	—	—	10	2	2	—
447	8	571	17	301	8	354	6	533	38	929	11	132	6	1,977	08	66	2
1,731	9	3,963	11	1,985	4	5,393	2	4,618	14	2,477	13	451	5	3,130	61	1,266	3
18	13	12	10	25	20	33	33	66	54	198	144	248	119	323	227	14	5
1	—	5	—	9	—	10	—	21	1	2	—	1	—	53	2	10	—
2,198	31	4,624	38	2,333	32	5,807	42	5,161	102	3,611	168	832	130	5,493	360	1,358	10
56	—	107	—	103	—	102	1	191	—	58	—	35	—	439	—	106	1
87	—	258	—	95	—	152	—	330	—	81	—	78	—	203	—	71	—
52	—	67	—	63	—	73	—	71	—	39	1	9	—	107	—	80	—
7	4	19	2	28	3	20	2	16	2	19	2	4	—	18	3	20	3
—	—	—	—	1	—	14	—	—	—	1	—	—	—	17	—	2	—
6	1	12	—	4	—	13	—	1	—	12	—	5	1	3	—	1	—
238	5	463	2	294	3	379	3	609	2	210	3	132	1	837	3	290	4
34	6	81	12	68	2	76	11	86	16	72	21	39	14	123	9	41	—
27	—	46	—	40	—	47	—	53	—	34	—	6	—	104	—	30	—
7	—	28	—	25	—	33	—	42	—	23	—	1	—	30	—	11	—
4	—	—	—	1	—	6	—	6	—	—	—	1	—	3	—	2	—
26	2	47	3	53	2	33	1	46	9	22	1	5	1	90	6	52	2
16	—	65	—	21	—	55	—	23	—	8	—	12	—	43	—	15	—
1	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—
124	4	169	3	136	1	260	11	343	7	148	5	46	5	1023	81	93	3
496	16	850	17	717	13	939	11	1238	30	719	16	381	4	2701	61	619	10
160	—	523	—	270	—	383	—	393	—	131	—	117	—	178	—	169	—
24	—	51	—	21	—	49	—	54	—	10	—	9	—	31	—	23	—
30	1	51	1	29	—	35	1	66	1	17	—	5	—	65	3	34	1
25	—	50	—	1	—	41	—	62	—	14	—	13	—	85	—	20	—
8	—	18	—	17	1	15	—	16	—	8	—	3	—	37	—	18	—
29	—	63	—	46	—	64	—	60	—	22	—	8	—	62	—	9	—
101	—	235	—	212	—	290	—	303	—	106	—	28	—	220	1	76	—
135	—	79	1	115	—	153	1	224	—	186	1	60	—	329	2	87	1
5	—	11	2	17	—	17	2	24	3	4	—	3	1	7	3	3	1
2	1	3	2	3	1	4	1	7	—	—	1	3	1	9	48	2	—
105	1	816	2	259	3	335	3	370	1	96	1	41	2	301	65	126	—
—	—	—	—	—	—	1	—	—	—	—	—	—	—	7	2	—	—
1	—	5	—	2	—	1	—	1	—	2	—	1	—	17	—	5	—
3,796	67	7,793	84	4,713	58	9,018	87	9,191	171	5,443	217	1,746	159	11,938	651	3,080	33

Ratio per 1,000

Order.	Military Divisions.	Pre-sidency.		Allaha-bad.		Oudh.		Rohil-cund.		Saugor.	
	Average Annual Strength.	1,426		3,374		2,702		1,713		941	
	Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
	I. General Diseases.										
	<i>Febrile Group.</i>										
	Eruptive Fevers	0.7	—	0.6	0.29	1.5	0.37	—	—	2.1	—
	Continued „	262.3	0.70	210.7	2.67	271.7	4.81	106.8	1.75	46.8	—
	Yellow Fever	—	—	—	—	—	—	—	—	—	—
	Paroxysmal Fevers	279.8	1.40	565.8	1.78	232.4	1.85	360.2	1.17	487.8	1.06
	Cholera	0.7	—	3.0	1.19	0.7	—	—	—	—	—
	Other diseases	4.9	—	0.6	—	4.8	0.37	0.6	—	3.2	—
	Total	548.4	2.10	780.7	5.93	511.1	7.40	467.6	2.92	539.9	1.06
	<i>Constitutional Group.</i>										
	Rheumatism	29.5	—	42.1	—	30.4	—	68.3	—	32.9	—
	Primary Syphilis	72.9	—	130.0	—	67.0	—	106.2	—	91.4	—
	Secondary „	18.2	—	35.9	—	24.8	0.37	52.5	—	53.1	—
	Tubercular Diseases	5.6	0.70	9.2	1.19	8.1	1.11	9.9	1.17	6.3	1.06
	Scurvy and Pupura	—	—	0.6	0.29	—	—	—	—	3.2	—
	Other diseases	2.8	0.70	0.3	—	4.4	0.37	9.9	—	4.3	—
	Total	129.0	1.40	227.0	1.48	134.7	1.85	246.9	1.17	190.2	1.06
	II. Local Diseases.										
	Diseases of the—										
1	Nervous System	14.7	0.70	22.2	4.74	25.9	2.96	14.0	2.34	22.3	4.25
2	Eye	16.1	—	23.1	—	27.0	—	18.1	—	15.9	—
3	Ear	10.5	—	11.6	—	17.0	—	11.7	—	7.4	—
4	Nose	—	—	0.3	—	0.7	—	0.6	—	—	—
5	Circulatory System	30.9	0.70	20.2	—	21.1	—	28.6	—	4.3	1.06
6	Absorbent „	12.6	—	40.3	—	15.2	—	11.1	—	13.8	—
7	Ductless Glands	—	—	0.3	—	—	—	1.8	0.58	—	—
8	Respiratory System	23.1	—	45.1	0.29	41.8	0.74	29.2	—	35.1	1.06
9	Digestive „	248.9	2.10	262.6	5.93	242.4	2.96	171.6	2.34	158.7	—
10	Urinary (Gonorrhœa	153.5	—	168.6	—	120.7	—	201.4	—	146.7	—
	System (Sequels of Gonorrhœa	15.4	—	19.0	—	11.8	—	15.2	—	5.3	—
	System (Other diseases	23.1	—	16.0	0.59	8.9	—	23.9	0.58	4.3	—
11	Generative System	18.2	—	13.0	—	15.2	—	9.9	—	24.4	—
12	Organs of Locomotion	5.6	—	3.6	—	3.3	—	5.8	—	4.3	—
13	Cellular Tissue	11.9	—	20.7	—	17.8	—	21.0	—	13.8	—
14	Cutaneous System	74.3	—	79.1	—	123.6	—	74.7	—	67.0	—
	III. Debility	43.5	0.70	35.6	—	29.2	—	36.8	—	26.6	—
	IV. Poisons	4.9	0.70	5.6	0.29	1.1	—	2.3	—	1.1	—
	V. Injuries.										
	General	0.7	0.70	0.6	0.59	0.4	1.48	1.2	—	—	—
	Local	100.3	0.70	91.0	1.48	95.9	0.74	79.4	58	71.2	2.12
	In action	—	—	—	—	—	—	—	—	—	—
	Surgical Operations	0.7	—	0.6	—	—	—	—	—	1.1	—
	No appreciable disease	0.7	—	1.2	—	0.7	—	2.9	—	—	—
	Cause unknown (refers to deaths only)	—	—	—	—	—	—	—	—	—	—
	General Total	1487.4	9.82	1888.0	21.34	1465.6	18.13	1475.8	10.51	1393.2	10.63

of Mean Strength.

Gwalior.		Meerut.		Sirhind.		Lahore.		Rawal Pindii.		Peshawar.		Troops on the March.		Field Service.		Hill Depôts.	
1,778		3,232		2,427		3,165		3,573		1,861		1,540		9,613		1,413	
Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
0'6	—	22'7	—	5'4	—	3'8	0'32	3'6	—	2'7	—	—	—	1'0	0'21	1'4	—
251'4	4'50	176'7	5'26	124'0	3'30	111'8	1'90	149'2	9'24	499'2	5'91	85'7	3'90	205'7	7'06	46'7	1'42
973'6	5'06	1226'2	3'40	817'8	1'65	1703'9	0'63	1264'5	3'92	1331'0	6'99	283'5	3'25	325'6	6'35	896'0	2'12
10'1	7'31	3'7	3'09	10'3	8'24	12'0	10'43	18'5	15'11	106'4	77'38	161'0	77'27	33'7	23'61	9'9	3'54
0'6	0'56	1'5	—	8'7	—	3'2	—	5'9	0'28	1'1	—	0'1	—	5'5	0'21	7'1	—
1236'2	17'44	1430'7	11'76	961'3	13'19	1834'8	13'27	1441'6	28'55	1940'4	90'27	540'3	84'42	571'4	57'44	961'1	7'08
31'5	—	33'1	—	42'4	—	32'2	0'32	53'5	—	31'2	—	22'7	—	50'9	—	75'0	0'71
48'9	—	79'8	—	30'1	—	48'0	—	92'4	—	43'5	—	51'3	—	21'1	—	50'2	—
46'1	20'7	20'7	—	26'0	—	24'6	—	19'9	—	21'0	0'54	5'8	—	11'1	—	56'6	—
3'9	2'25	5'9	0'62	11'5	1'24	6'3	0'63	4'4	0'56	10'2	1'07	2'6	—	1'9	0'31	14'2	2'12
—	—	—	—	0'4	—	4'4	—	—	—	0'5	—	—	—	1'8	—	1'4	—
3'4	0'56	8'7	—	1'6	—	4'1	—	0'2	—	6'4	—	3'2	0'65	0'3	—	0'7	—
133'9	2'81	143'3	0'62	121'1	1'24	119'7	0'95	170'4	0'56	112'8	1'61	85'7	0'65	87'1	0'31	198'2	2'83
19'1	3'37	25'1	3'71	28'0	0'82	24'0	3'47	24'1	4'48	38'7	11'28	25'3	9'09	12'8	0'94	29'0	—
15'1	—	14'2	—	16'5	—	14'8	—	16'4	—	18'3	—	4'0	—	10'8	—	21'2	—
3'9	—	8'7	—	10'3	—	10'4	—	11'8	—	12'4	—	0'6	—	3'1	—	7'8	—
2'2	—	1'2	—	0'4	—	1'9	—	1'7	—	—	—	0'6	—	0'3	—	1'4	—
14'6	1'12	14'5	0'93	21'8	0'82	10'4	0'32	12'9	2'52	11'8	0'54	3'2	0'65	9'4	0'62	36'8	1'42
9'0	—	20'1	—	8'7	—	17'4	—	7'8	—	4'3	—	7'8	—	4'5	—	10'6	—
0'6	—	—	—	—	—	—	—	0'2	—	—	—	—	—	—	—	—	—
69'7	2'25	52'3	0'93	56'0	0'41	82'1	3'47	96'8	1'96	79'5	2'69	29'9	3'25	106'4	8'43	69'4	2'12
279'0	9'00	263'0	5'26	295'4	5'36	296'7	3'47	346'5	8'40	386'3	8'60	247'4	2'60	251'0	6'35	433'0	7'08
90'0	—	161'8	—	111'2	—	121'0	—	110'0	—	70'4	—	76'0	—	18'5	—	119'6	—
13'5	—	15'8	—	8'7	—	15'5	—	15'1	—	5'4	—	5'8	—	3'2	—	16'3	—
16'9	0'56	15'8	0'31	11'9	—	11'1	0'32	18'4	0'28	9'1	—	3'2	—	6'8	0'31	24'1	0'71
14'1	—	15'5	0'31	12'4	—	13'0	—	17'4	—	7'5	—	8'4	—	8'8	—	14'2	—
4'5	—	5'6	—	7'0	0'41	4'7	—	4'3	—	4'3	—	1'9	—	3'8	—	5'7	0'71
16'3	—	19'5	—	19'0	—	20'2	—	16'8	—	11'8	—	5'2	—	6'4	—	13'4	—
56'8	—	72'4	—	87'4	—	88'5	—	54'8	—	57'0	—	18'2	—	22'9	0'10	53'8	—
75'9	—	24'4	0'31	47'4	—	49'9	0'32	62'7	—	99'9	0'54	39'0	—	34'2	0'21	61'6	0'71
2'8	—	3'4	0'62	7'0	—	5'4	0'63	6'7	0'84	2'1	—	1'9	0'65	7	0'31	2'1	0'71
1'1	0'56	0'9	0'62	1'2	0'41	1'3	0'32	2'0	—	—	0'54	1'9	0'65	0'9	4'99	1'4	—
59'1	0'56	97'8	0'62	106'7	1'23	105'8	0'95	103'6	0'28	51'6	0'54	26'6	1'30	31'3	0'62	89'2	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	14'9	6'76	—	—
0'6	—	1'5	—	1'6	—	0'3	—	0'2	—	1'1	—	0'6	—	7	0'21	1'4	—
—	—	—	—	—	—	—	—	—	—	—	—	—	—	1'8	—	3'5	—
2135'0	37'68	2408'1	25'99	1941'9	23'90	2349'3	27'49	2572'3	47'88	2924'8	116'60	1133'8	103'25	1241'9	67'72	2179'8	23'35

ABSTRACT No. XVII.—TABLE showing the ADMISSIONS and the DEATHS from ENTERIC FEVER in the BENGAL COMMAND.

Divisions.	Stations.	1st Quarter.		2nd Quarter.		3rd Quarter.		4th Quarter.		Total.	
		Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.
Presidency -	Dum-Dum -	1	1	—	—	—	—	—	—	1	1
Allahabad -	Allahabad -	—	—	1	—	2	1	5	1	8	2
	Dinapore -	—	—	1	1	1	—	—	—	2	1
	Benares -	—	—	—	—	1	1	1	—	2	1
	Cawnpore -	—	—	1	—	5	4	1	—	7	4
	Chunar -	—	—	—	—	—	—	1	1	1	1
Oudh -	Lucknow -	20	4	16	5	8	3	2	—	46	12
	Fyzabad -	3	1	2	—	—	—	2	—	7	1
Rohilcund -	Bareilly -	1	—	1	1	—	—	1	—	3	1
	Shahjahanpur -	—	1	—	—	1	—	1	—	2	1
	Moradabad -	—	—	—	—	1	1	—	—	1	1
	Choubuttia -	—	—	1	—	—	—	—	—	1	—
Saugor -	Saugor -	—	—	—	—	—	—	1	—	1	—
Gwalior -	Morar -	5	1	3	2	4	2	3	3	15	8
Meerut -	Meerut -	1	1	2	1	—	—	1	—	4	2
	Agra -	1	—	—	—	—	—	1	1	2	1
	Roorkee -	—	—	—	—	2	—	—	—	2	—
	Chakrata -	—	—	1	1	—	—	—	—	1	1
	Muttra -	1	—	8	5	5	3	10	5	24	13
	Fatehgarh -	—	—	—	—	1	—	—	—	1	—
	Umballa -	—	—	2	1	2	—	—	—	4	1
Sirhind -	Jullundur -	—	—	2	—	1	1	—	—	3	1
	Subathu -	—	—	5	2	21	3	—	—	26	5
	Dagshai -	—	—	1	—	4	1	—	—	5	1
	Jutogh -	—	—	—	—	2	—	—	—	2	—

Divisions.	Stations.	1st Quarter.		2nd Quarter.		3rd Quarter.		4th Quarter.		Total.	
		Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.
Lahore -	Meen Meer -	2	1	6	1	1	—	1	—	10	2
	Lahore -	—	—	1	—	—	—	1	1	2	1
	Ferozepore -	1	—	1	1	—	—	1	1	3	2
	Mooltan -	1	—	2	1	—	—	—	—	3	1
	Rawal Pindi -	1	1	9	4	1	1	7	3	18	9
Rawal Pindi	Camp Hassen Abdul	—	—	—	—	—	—	1	—	1	—
	Sialkot -	1	1	10	3	6	8	3	3	20	15
	Camp Cherealla	—	—	—	—	5	1	—	—	5	1
	Campbellpore	—	—	—	—	1	1	—	—	1	1
	Kolabagh -	—	—	—	—	2	1	—	—	2	1
	Camp Gharial	—	—	—	—	—	—	1	1	1	1
	Camp Thoba	—	—	1	—	—	—	—	—	1	—
	Chungla Gully	—	—	2	1	—	—	—	—	2	1
	Fort Attock -	—	—	4	1	1	2	—	—	5	3
	Kooldunna -	—	—	1	1	—	—	1	—	2	1
	Peshawur -	1	—	4	3	3	2	—	—	8	5
	Nowshera -	1	—	4	3	2	—	1	—	8	3
Peshawur	Cherat -	—	—	—	—	8	3	1	—	9	3
	Cholera Camp	—	—	1	—	—	—	—	—	1	—
Hill Depôts -	Naini Tal -	—	—	2	1	—	—	—	—	2	1
	Kasauli -	—	—	3	—	3	—	—	—	6	—
	Murree -	—	—	1	1	—	—	—	—	1	1
	Darjeeling -	—	—	—	—	—	—	1	—	1	—
	Troops marching -	1	1	6	4	—	—	1	—	8	5
Total in the Command -		42	13	105	44	94	39	50	20	291	116

ABSTRACT No. XVIII.—TABLE showing the STATIONS in the BENGAL COMMAND at which the ADMISSIONS and DEATHS from CHOLERA took place in each of the four quarters of the year.

Divisions and Stations.			1st Quarter.		2nd Quarter.		3rd Quarter.		4th Quarter.		Total.	
			Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.	Admissions.	Deaths.
Presidency	-	Calcutta	-	-	-	-	1	-	-	-	1	-
Allahabad	{	Allahabad	-	-	-	-	-	-	1	-	1	-
		Allahabad Fort	-	-	1	-	-	-	-	-	1	-
		Benares	-	-	2	1	-	-	-	-	2	1
		Chunar	-	-	1	1	1	-	-	-	2	1
		Cawnpore	-	-	4	2	-	-	-	-	4	2
Oudh	-	Lucknow	-	-	1	-	1	-	-	-	2	-
Gwalior	{	Morar	-	-	2	-	15	11	-	-	17	11
		Fort Gwalior	-	-	-	-	1	1	-	-	1	1
Meerut	{	Cholera Camp-	-	-	1	-	-	-	-	-	1	-
		Meerut	-	-	10	10	-	-	-	-	10	10
Sishind	{	Umballa	-	-	9	7	-	-	-	-	9	7
		Jullundur	-	-	3	3	-	-	-	-	3	3
		Dagshai	-	-	2	1	-	-	-	-	2	1
		Solon -	-	-	1	-	-	-	-	-	1	-
		Subathu	-	-	-	-	10	9	-	-	10	9
Lahore	{	Meean Meer	-	-	22	21	-	-	-	-	22	21
		Cholera Camp-	-	-	11	7	-	-	-	-	11	7
		Ferozepore	-	-	3	3	-	-	-	-	3	3
		Fort Lahore	-	-	-	-	1	1	-	-	1	1
		Fort Kangra	-	-	-	-	1	1	-	-	1	1
Rawul Pindi	{	Rawul Pindi	-	-	11	11	17	11	2	3	30	25
		Sialkot	-	-	1	1	2	1	1	1	4	3
		Fort Attock	-	-	5	5	-	-	-	-	5	5
		Kooldunna	-	-	6	4	1	1	-	-	7	5
		Camp Gharial	-	-	1	1	1	1	-	-	2	2
		Khrya Gully	-	-	-	-	9	6	-	-	9	6
		Camp Cherealla	-	-	-	-	8	8	-	-	8	8
		Murree	-	-	-	-	1	-	-	-	1	-
Peshawur	{	Peshawur	-	-	97	59	61	51	2	2	160	112
		Peshawur Cho-	-	-	7	6	4	3	-	-	11	9
		lera Camp.	-	-	-	-	-	-	-	-	-	-
		Nowshera	-	-	6	5	2	2	-	-	8	7
		Nowshera Cho-	-	-	8	10	-	-	-	-	8	10
Hill depôts	{	Cherat	-	-	10	3	1	3	-	-	11	6
		Murree	-	-	2	2	10	4	-	-	12	6
		Kasauli	-	-	-	-	2	1	-	-	2	1
Troops marching			-	-	230	109	16	9	2	1	248	119
Total			-	-	457	272	166	124	8	7	631	403

ABSTRACT No. XIX.—The PREVALENCE of DYSENTERY, DIARRHŒA, and HEPATITIS in each of the DIVISIONS in the BENGAL COMMAND, and the DEATHS due to them, are shown in the following Tables:—

Divisions.	Pre- sidency.	Alla- habad.	Oudh.	Rohtas- cund.	Saugor.	Gwalior.	Meerut.	Sirhind.	Lahore.	Rawal Pind.	Peshawar.	Depôts.	Troops on March.													
Strength.	1,496	3,374	2,702	1,713	941	1,778	3,252	2,427	3,105	3,373	1,861	1,413	1,540													
Diseases.																										
Dysentery -	65	1	97	3	119	1	37	—	35	—	114	9	131	6	87	5	107	5	206	14	94	9	70	3	103	2
Diarrhoea -	72	2	223	—	192	1	45	—	10	—	152	1	221	2	203	—	232	—	422	1	335	—	172	—	187	4
Hepatitis and Abscess of the Liver.	51	—	128	14	119	3	63	4	37	—	81	6	146	8	91	6	96	6	153	10	94	3	106	4	41	1
Total -	188	3	448	17	430	5	145	4	82	—	347	16	498	16	353	11	435	11	786	25	523	12	348	7	331	7

Ratio per 1,000 of Strength.

Dysentery -	45.58	70	28.75	89	44.04	37	21.00	—	37.19	—	64.12	5.06	40.53	1.86	35.85	2.06	33.81	1.58	57.66	3.92	50.51	4.84	49.54	2.12	60.88	1.30
Diarrhoea -	50.49	1.40	66.69	—	71.00	37	26.27	—	10.63	—	85.40	56.08	38.62	84.47	—	73.30	—	118.11	28.180	0.01	—	121.73	—	121.43	2.00	
Hepatitis and Abscess of the Liver.	35.77	—	37.94	15	44.01	1.11	36.78	2.34	39.32	—	45.55	3.38	45.17	2.47	37.40	2.47	30.33	1.90	44.22	2.80	50.51	1.01	75.02	2.83	26.62	.05
Total -	131.94	2.10	132.78	5.04	159.14	1.85	84.05	2.34	87.14	—	195.16	9.00	154.08	4.93	157.81	4.53	137.44	3.46	219.99	7.00	231.03	6.45	246.29	4.95	214.93	4.55

ABSTRACT No. XX.—TABLE showing the PREVALENCE and MORTALITY in the BENGAL COMMAND, due to DYSENTERY, DIARRHŒA, and HEPATITIS, in each Quarter of the Year 1879.

	Dysentery.				Diarrhœa.				Hepatitis (including Abscess of the Liver.				Total.			
	Number.		Ratio per 1,000 of the Strength.		Number.		Ratio per 1,000 of the Strength.		Number.		Ratio per 1,000 of the Strength.		Number.		Ratio per 1,000 of the Strength.	
	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
1st Quarter	211	5	7·24	·17	295	0	10·12	—	192	16	6·59	·55	698	21	23·95	·72
2nd "	308	17	10·57	·58	796	4	27·31	·14	306	13	10·50	·44	1,410	34	48·38	1·16
3rd "	411	17	14·10	·58	974	5	33·42	·17	403	18	13·83	·62	1,788	40	61·35	1·37
4th "	395	19	11·49	·65	403	2	13·83	·07	310	18	10·63	·62	1,048	39	35·95	1·34
Total for Year	1,265	58	43·40	1·98	2,468	11	84·68	·38	1,211	65	41·55	2·23	4,944	134	169·63	4·59

ABSTRACT No. XXI.—TABLE, taken from the REPORT of the PRINCIPAL MEDICAL OFFICER, showing the COMPARATIVE MORTALITY and INVALIDING in the THREE GRADES of COMMISSIONED OFFICERS, NON-COMMISSIONED OFFICERS, and PRIVATES during the Year under Report, and for the Nine previous Years in the BENGAL COMMAND:—

Years.	Average Strength.			Number of Deaths.			Invalided.			Ratio per 1,000.					
	Average Strength.			Number of Deaths.			Invalided.			Deaths.			Invalids.		
	Commissioned Officers.	Non-commissioned Officers.	Privates.	Commissioned Officers.	Non-commissioned Officers.	Privates.	Commissioned Officers.	Non-commissioned Officers.	Privates.	Commissioned Officers.	Non-commissioned Officers.	Privates.	Commissioned Officers.	Non-commissioned Officers.	Privates.
1869	1,567	3,766	31,651	32	195	1,319	70	189	1,423	20.42	51.78	41.67	44.67	50.19	44.96
1870	1,514	3,420	30,985	31	108	639	93	161	1,243	20.48	31.58	20.62	61.43	47.08	40.12
1871	1,424	3,395	32,156	25	68	568	114	145	1,383	17.56	20.03	17.66	80.06	42.71	43.01
1872	1,376	3,460	33,319	20	131	864	93	185	1,371	14.53	37.86	25.93	67.59	53.47	41.15
1873	1,371	2,777	34,397	20	82	482	97	174	1,255	14.59	29.53	14.01	70.75	62.66	36.48
1874	1,443	3,815	33,886	23	65	477	64	148	1,235	15.94	17.04	14.10	44.35	38.79	36.50
1875	1,485	3,842	34,053	10	96	544	75	142	1,189	6.73	24.99	15.98	50.51	36.96	34.92
1876	1,735	3,820	33,417	39	95	503	96	178	1,257	22.48	24.87	15.05	55.33	46.60	37.61
1877	2,066	3,787	32,761	29	57	357	83	136	1,162	14.04	15.05	10.90	40.17	35.91	35.47
1878	2,018	3,782	32,374	28	86	694	79	141	1,300	13.87	22.74	21.44	39.15	37.28	40.16
Average for 10 years	1,600	3,586	32,995	26	98	645	86	160	1,292	16.25	27.33	19.61	53.75	44.62	38.97
1879	2,010	4,266	34,615	74	183	1,444	124	204	1,437	36.82	42.90	41.72	61.69	47.82	41.51
1879	Killed in action and died from wounds received in battle Number and per 1,000 of deaths, excluding those killed in action and died from wounds received in battle			10	12	55	—	—	—	4.98	2.81	1.59	—	—	—
1879				64	171	1,389	—	—	—	31.84	40.08	40.13	—	—	—

ABSTRACT No. XXII.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS into serving in the MADRAS PRESIDENCY during the year 1879, with the Ratios

Orders.	Average Strength, 10,507.		Deaths.			Invalids.		Average Number constantly Sick.
	Diseases.	Admissions into Hospital.	In the Command.	Of Invalids.	Total.	Number sent Home.	Number finally Discharged the Service.	
	I.—General Diseases.							
	<i>Febrile Group.</i>							
	Eruptive Fevers -	4	—	—	—	—	—	—
	Continued „ -	1,382	18	—	18	—	—	46
	Yellow Fever -	—	—	—	—	—	—	—
	Paroxysmal Fevers -	2,793	6	—	6	6	—	75
	Cholera -	36	23	—	23	—	—	1
	Other diseases -	34	—	—	—	—	—	1
	Total -	4,249	47	—	47	6	—	123
	<i>Constitutional Group.</i>							
	Rheumatism -	311	1	—	1	16	12	16
	Primary Syphilis -	1,191	—	—	—	—	—	93
	Secondary „ -	232	1	—	1	17	9	20
	Tubercular diseases -	66	11	1	12	24	24	9
	Scurvy and Purpura -	4	—	—	—	—	—	1
	Other diseases -	57	—	—	—	7	2	5
	Total -	1,881	13	1	14	64	47	144
	II.—Local Diseases.							
	<i>Diseases of the—</i>							
1	Nervous System -	216	22	1	23	43	11	13
2	Eye -	179	—	—	—	7	6	8
3	Ear -	123	—	—	—	2	5	4
4	Nose -	5	—	—	—	—	—	—
5	Circulatory System -	208	9	1	10	48	28	13
6	Absorbent „ -	294	—	—	—	—	—	29
7	Ductless Glands -	—	—	—	—	—	—	—
8	Respiratory System -	386	4	2	6	14	16	18
9	Digestive „ -	3,159	51	7	58	151	30	146
10	Urinary { Gonorrhœa -	1,002	—	—	—	—	—	57
	System { Sequelæ of Gonorrh. -	138	—	—	—	5	2	11
	{ Other diseases -	78	5	—	5	4	1	3
11	Generative System -	133	—	—	—	—	—	6
12	Organs of Locomotion -	43	1	—	1	5	3	4
13	Cellular Tissue -	204	—	—	—	—	—	8
14	Cutaneous System -	818	—	—	—	2	3	32
	III.—Debility -	461	—	—	—	110	69	25
	IV.—Poisons -	27	1	1	2	—	—	1
	V.—Injuries.							
1	General -	4	13	—	13	—	—	—
2	Local -	1,120	7	—	7	6	12	40
3	In action -	—	—	—	—	—	—	—
	No appreciable disease -	9	—	—	—	—	—	—
	Cause unknown (refers to deaths only).	—	—	—	—	—	—	—
	General Total -	14,737	173	13	186	467	233	685
	Average for 10 years, 1869-78	—	—	—	—	—	—	—

* The average ratios for 10 years will be given in future years. The ratios for the year 1879 will be given

HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK among the TROOPS per 1,000 of the Strength, and the Average Ratios for 10 Years.*

Ratio per 1,000.					*Average Ratio per 1,000, from 18 to 18 .				
Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.	Admissions.	Deaths.	Invalids sent Home.	Invalids finally Discharged.	Constantly Sick.
—	—	—	—	—	—	—	—	—	—
131·5	1·71	—	—	4·38	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
265·8	·57	·57	—	7·14	—	—	—	—	—
3·4	2·19	—	—	·09	—	—	—	—	—
3·3	—	—	—	·09	—	—	—	—	—
404·4	4·47	·57	—	11·70	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
29·6	·09	1·52	1·15	1·52	—	—	—	—	—
113·3	—	—	—	8·85	—	—	—	—	—
24·0	·09	1·62	·85	1·91	—	—	—	—	—
6·3	1·15	2·28	2·28	·86	—	—	—	—	—
·4	—	—	—	·09	—	—	—	—	—
5·4	—	·67	·19	·48	—	—	—	—	—
179·0	1·83	6·09	4·47	13·71	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
20·6	2·19	4·09	1·05	1·24	—	—	—	—	—
17·0	—	·67	·57	·76	—	—	—	—	—
11·7	—	·19	·48	·38	—	—	—	—	—
·5	—	—	—	—	—	—	—	—	—
19·8	·95	4·57	2·66	1·24	—	—	—	—	—
28·0	—	—	—	2·76	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
36·8	·57	1·33	1·52	1·71	—	—	—	—	—
300·6	5·52	14·37	2·85	13·90	—	—	—	—	—
95·4	—	—	—	5·42	—	—	—	—	—
13·1	—	·48	·19	1·05	—	—	—	—	—
7·4	·48	·38	·09	·29	—	—	—	—	—
12·7	—	—	—	·57	—	—	—	—	—
4·1	·09	·48	·29	·88	—	—	—	—	—
19·4	—	—	—	·76	—	—	—	—	—
77·8	—	·19	·29	3·04	—	—	—	—	—
43·9	—	10·47	6·57	2·38	—	—	—	—	—
2·6	·19	—	—	·09	—	—	—	—	—
·4	1·24	—	—	—	—	—	—	—	—
106·6	·67	·57	1·15	3·81	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
·8	—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
1402·6	17·70	44·45	22·18	65·19	—	—	—	—	—
1215·2	19·78	46·08	17·86	57·80	—	—	—	—	—

in the Report for 1880, those for 1879 to 1880 in that for 1881, those for 1879 to 1881 in that for 1882, &c., &c.

ABSTRACT No. XXIII.—TABLE showing the ADMISSIONS and DEATHS at each of the PRINCIPAL STATIONS in the MADRAS COMMAND, taken from the REPORT of the PRINCIPAL MEDICAL OFFICER.

Stations.	Average Strength.	Average Daily Sick.	Admitted.	Died in and out of Hospital.	Invalided.	Ratio per 1,000 of Strength.					
						Average Daily Sick.	Admitted.	Died.	Invalided.	Average of previous Period of 10 Years.	
										Admitted.	Died.
PRESIDENCY :											
Fort St. George -	462	35	798	5	31	75.76	1716.45	10.82	67.10	1243.16	19.10
Palaveram -	12	—	8	—	—	—	666.67	—	—	399.04	9.86
St. Thomas's Mt. -	306	22	352	3	6	71.90	1150.33	9.80	19.61	1274.92	22.54
Trichinopoly -	144	9	163	1	2	54.88	993.90	6.10	12.20	1333.72	24.40
Bellary -	599	66	1,363	11	25	110.18	2275.46	18.36	41.74	1216.01	9.83
Total -	1,543	132	2,679	20	64	85.55	1736.23	12.96	41.48	—	—
MYSORE :											
Bangalore -	1,278	118	2,126	16	61	92.33	1663.54	12.52	47.73	1203.12	12.08
Cannanore -	428	30	933	5	44	91.12	2179.91	11.68	102.80	1166.33	16.35
Calicut -	95	4	85	1	5	42.11	894.74	10.53	52.63	1067.35	17.08
Malliaporam -	92	4	121	3	4	43.48	1315.22	32.61	43.46	874.52	14.27
Total -	1,893	165	3,265	25	114	87.16	1724.77	13.21	60.22	—	—
HYDERABAD :											
Secunderabad -	2,181	150	2,948	25	90	63.78	1351.67	11.46	41.27	1255.47	22.66
Kamptee -	877	54	1,403	17	13	61.57	1599.77	19.38	14.82	1640.63	16.76
Seetabuldee -	52	2	110	—	2	38.46	2115.38	—	38.46	1591.96	12.62
Total -	3,110	206	4,461	42	105	66.24	1434.40	13.50	33.76	—	—
BURMAH :											
Rangoon -	754	44	1,123	10	26	58.36	1489.39	13.26	33.16	1174.80	15.64
Thayetmyo -	1,094	65	1,388	41	75	59.41	1268.74	40.22	68.56	1184.97	21.57
Tonghoo -	444	16	408	4	13	36.04	918.92	9.01	29.28	981.85	16.21
Tayrangoon -	354	13	343	5	6	36.72	968.93	14.12	16.96	—	—
Port Blair -	129	5	171	2	2	38.76	1325.58	15.50	15.50	726.12	9.35
Total -	2,775	143	3,433	65	121	51.53	1237.11	23.42	43.00	—	—
TROOPS TREATED AT CONVALESCENT DEPÔTS AND OTHER HOSPITALS :											
Poonamallee -	173	20	212	6	9	115.01	1225.43	34.68	52.02	2742.82	60.82
Wellington -	473	23	456	6	18	43.63	964.06	12.68	38.05	1373.16	17.55
Ramandroog -	17	1	45	—	1	58.82	2047.06	—	53.82	1279.26	10.27
Elsewhere -	7	—	—	—	33	—	—	—	4714.29	—	24.28
Total -	670	44	713	12	61	65.67	1064.18	17.81	91.04	—	—
ON THE MARCH	225	9	147	9	2	40.09	653.33	40.00	8.89	700.17	44.48

ABSTRACT No. XXIV.—TABLE, taken from the PRINCIPAL MEDICAL OFFICER'S REPORT, showing the PREVALENCE and MORTALITY of the different Classes of DISEASES in each of the ADMINISTRATIVE CIRCLES in the MADRAS COMMAND.

Divisions	Presi- dency.	Mysore.	Hyder- abad.	Burmah.	Depôts.	On the March.	Ratio per 1,000 of Strength.						Depôts.	On the March.
							Admitted.	Died.	Admitted.	Died.	Admitted.	Died.		
Average Strength	1,543	1,893	3,110	2,775	643	223	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
Diseases.	Admitted.	Admitted.	Admitted.	Admitted.	Admitted.	Admitted.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
I. General Diseases.														
<i>Febile group—</i>														
Eruptive Fevers	2	—	—	1	—	—	1 30	—	—	—	—	—	—	—
Continued "	327	4	234	4	58	15	211 92	2 59	157 96	3 17	75 24	1 29	167 12	68 67
Yellow Fever	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Paroxysmal Fevers	780	1	1,220	2	121	18	505 51	66	112 52	—	392 28	64	103 96	80 60
Cholera	—	—	2	34	—	—	—	—	—	—	—	—	—	—
Other Diseases	—	7	27	—	—	—	—	—	3 70	—	8 63	—	—	—
Total of Febrile group	1,109	519	1,483	27	180	33	718 73	3 24	274 17	3 17	476 85	2 25	333 69	146 67
<i>Constitutional group—</i>														
Rheumatism	—	—	106	57	10	4	23 98	—	51 24	—	34 08	32	20 54	17 79
Primary syphilis	37	380	550	110	45	9	186 00	—	210 74	—	114 47	39 04	67 87	40 00
Secondary "	47	45	83	32	36	1	30 46	—	23 77	—	26 69	32	11 53	4 44
Tubercular diseases	11	25	9	11	6	1	7 13	65	13 21	1 06	2 90	0 65	3 97	8 30
Scurvy and Purpura	—	—	1	4	—	—	—	—	—	—	—	—	—	—
Other Diseases	5	28	6	5	1	—	3 24	—	20 07	—	0 32	—	1 44	—
Total of constitutional group	387	585	561	219	98	15	250 81	65	309 03	1 06	180 39	1 29	78 92	66 67

Orders.	Divisions - - - {	Presi- dency.	Mysore.		Hyder- abad.		Burmah.		Mysore.		Hyderabad.		Burmah.		Depôts.		On the March.	
			1,863		3,110		2,775		Ratio per 1,000 of Strength.		Ratio per 1,000 of Strength.		Ratio per 1,000 of Strength.		Ratio per 1,000 of Strength.		Ratio per 1,000 of Strength.	
			Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
1	II. Local Diseases.																	
2	Diseases of the—																	
3	Nervous System -	34	53	5	54	6	63	7	9	1	5	1	22 03	1 29	38 00	2 64	17 36	1 93
4	Eye -	34	45	—	61	—	23	—	12	—	—	—	23 77	—	23 77	—	10 61	—
5	Nose -	29	27	—	32	—	20	—	5	—	—	—	11 26	—	11 26	—	10 45	—
6	Circulatory System	16	—	—	2	—	1	—	1	—	—	—	0 65	—	0 65	—	0 36	—
7	Absorbent	16	77	—	42	3	64	3	5	2	1	1	10 37	—	40 68	—	13 50	—
8	Ductless Glands -	91	—	—	118	—	30	—	22	—	—	—	16 38	—	16 38	—	37 94	—
9	Respiratory System	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
10	Digestive	42	86	1	102	1	131	—	—	—	—	—	45 43	—	45 43	—	32 80	—
11	Urinary { Sequelæ of	300	703	9	912	15	943	15	167	5	43	2	104 43	4 53	418 91	4 75	233 25	4 82
12	Gonorrhoea	244	262	—	301	—	146	—	41	7	3	—	138 40	—	138 40	—	90 79	—
13	System { Gonorrhoea.	16	29	—	67	—	17	—	10	—	—	—	15 32	—	15 32	—	21 54	—
14	Other diseases -	11	12	1	25	1	15	—	9	2	2	—	7 13	0 65	6 34	0 53	8 04	0 32
15	Generative system	16	15	—	46	—	40	—	5	—	—	—	10 37	—	14 79	—	17 66	—
16	Organs of Locomotion	6	1	—	17	—	12	—	5	—	—	—	3 80	0 65	2 11	—	5 47	—
17	Cellular Tissue -	34	45	—	43	—	55	—	13	—	—	—	22 03	—	23 77	—	15 43	—
18	Cutaneous System	108	211	—	189	—	245	—	40	—	11	—	69 96	—	111 46	—	60 77	—
19	III. Debility	40	204	—	69	—	116	—	13	—	7	—	31 76	—	107 77	—	22 19	—
20	IV. Poisons	4	3	—	9	—	8	—	2	—	1	—	2 89	—	1 59	—	2 90	—
21	V. Injuries.																	
22	General -	1	—	1	2	4	1	4	—	—	—	—	0 65	1 20	—	0 53	0 65	1 29
23	Local -	147	262	—	315	1	335	4	46	1	8	—	95 27	0 65	138 40	—	101 27	0 32
24	In action	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
25	No appreciable Disease	—	—	—	6	—	1	—	—	—	—	—	—	—	—	—	—	—
26	Cause unknown -	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
27	Total -	2,679	3,205	25	4,461	43	3,433	65	713	12	147	9	17 96	23 12 96	1724 77	13 21	1434 40	13 50
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ABSTRACT No. XXV.—TABLE showing the STATIONS where CASES of ENTERIC FEVER occurred in the MADRAS COMMAND, and the Months during which they were admitted into HOSPITAL, taken from the RETURNS furnished by the PRINCIPAL MEDICAL OFFICER:—

Stations.	Average Strength.	Admissions for Enteric Fever.										Total.		Deaths.		
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Number admitted.	Ratio per 1,000 of Strength.	Number died.
Bangalore	1,278	—	—	—	—	—	—	1	3	—	—	—	5	3·91	5	3·91
Secunderabad . . .	2,181	—	—	—	—	—	—	—	—	—	—	—	1	·45	1	·45
Kamptee	877	—	—	—	1	—	—	1	1	—	1	—	4	4·56	3	2·28
Tonghoo	444	—	—	—	—	1	—	—	—	—	—	1	2	4·50	2	4·50

The AGES and PERIODS of RESIDENCE in INDIA of those attacked by ENTERIC FEVER are shown in the following TABLES, which are taken from the REPORT of the PRINCIPAL MEDICAL OFFICER:—

Ages.	Number admitted for Enteric Fever.	Ratio per 1,000 of Strength.	Number of Deaths from Enteric Fever.	Ratio per 1,000 of Strength.
20 to 22 -	5	3·6	4	2·9
22 to 25 -	2	1·2	1	·6
25 to 27 -	4	2·6	4	2·6
27 to 30 -	1	·5	1	·5

Service in India.	Number admitted for Enteric Fever.	Ratio per 1,000 of Strength.	Number of Deaths from Enteric Fever.	Ratio per 1,000 of Strength.
Under 1 year -	7	5·6	6	4·8
1 to 2 years -	1	·6	1	·6
2 to 3 -	1	1·4	1	1·4
3 to 4 „ -	2	1·2	1	·6
7 to 8 „ -	1	·3	1	·3

ABSTRACT No. XXVI.—TABLE showing the RELATIVE PREVALENCE of DYSENTERY, DIARRHŒA, HEPATITIS, and DYSPEPSIA, in each DIVISION of the MADRAS COMMAND, taken from the REPORT of the PRINCIPAL MEDICAL OFFICER:—

Circles.	Ratio per 1,000 of Strength.											
	Presidency.		Mysore.		Hyderabad.		Burmah.		Depôts.		On the March.	
Diseases.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
Dysentery - - -	44·72	1·30	84·52	1·06	74·59	·96	52·25	1·44	105·58	1·51	62·22	—
Diarrhœa - - -	29·16	—	87·09	—	51·44	—	100·67	—	13·58	1·51	35·56	—
Hepatitis, including abscess of liver -	22·69	2·59	78·18	3·69	49·84	3·86	71·71	3·97	80·33	4·52	40·00	—
Total - - -	96·57	3·89	229·79	4·75	175·87	4·82	230·63	5·41	179·49	7·54	137·78	—
Dyspepsia - - -	53·14	—	118·86	—	63·99	—	68·11	—	16·59	—	13·33	—

ABSTRACT No. XXVII.—TABLE showing the relation between the PREVALENCE and MORTALITY of DYSENTERY and HEPATITIS, including ABSCESS of LIVER, taken from the REPORT of the PRINCIPAL MEDICAL OFFICER :—

Stations.	Ratio per 1,000 of Strength.					
	1879.		1878.		Average of previous Period of Ten Years. 1869 to 1878.	
	Admitted for Dysentery, Hepatitis, including Abscess of Liver.	Died from these Diseases.	Admitted for Dysentery, Hepatitis, including Abscess of Liver.	Died from these Diseases.	Admitted for Dysentery, Hepatitis, including Abscess of Liver.	Died from these Diseases.
PRESIDENCY:						
Fort St. George and Palaveram.	40·08	4·22	144·48	4·87	130·0	4·60
St. Thomas' Mount -	32·68	3·26	143·77	6·39	214·6	8·51
Trichinopoly -	6·10	—	167·29	7·43	187·1	6·83
Bellary -	8·35	1·67	74·80	2·30	114·0	1·93
MYSORE:						
Bangalore -	40·69	2·35	126·71	3·11	141·7	3·37
Cannanore -	196·26	9·35	250·00	7·81	291·5	7·13
Calicut -	31·58	—	336·73	20·41	245·0	9·59
Malliaporam -	97·82	—	157·89	—	275·2	4·43
HYDERABAD:						
Secunderabad -	59·15	3·66	364·63	8·90	283·2	9·34
Kamptee and Seeta-buldee.	27·99	4·31	103·02	1·12	123·0	2·11
BURMAH:						
Rangoon -	45·09	2·65	310·67	12·00	247·6	6·90
Thayetmyo -	91·41	6·40	192·56	1·62	181·3	1·87
Tonghoo -	65·32	2·25	314·07	17·59	310·9	6·51
Tayrangoon -	79·10	2·82	—	—	—	—
Port Blair -	62·01	—	146·15	—	102·6	0·90

ABSTRACT No. XXVIII.—TABLE showing the EXTENT OF SICKNESS, MORTALITY, and INVALIDING in each CORPS serving in the MADRAS COMMAND, taken from the REPORT of the PRINCIPAL MEDICAL OFFICER.

Corps.	Average Annual Strength.	Admitted into Hospital.	Deaths in the Command.	Invalided.	Average Daily Sick.	Ratio per 1,000 of Strength.				Average Time to Sick Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the Year.	Years of Service in India.
						Admissions into Hosp.	Deaths.	Invalids.	Average Daily Sick.				
Royal Engineers	35	27	—	—	1.23	771.43	—	—	32.14	13.20	16.62	—	months.
CAVALRY.													
12th Lancers	460	591	11	27	42.66	1284.78	23.91	58.69	92.74	33.86	26.35	Secunderabad	2 11
14th Hussars	471	584	6	21	46.54	1239.91	12.74	44.59	85.65	31.25	25.21	Bangalore	3 11
Total	931	1,175	17	48	83.00	1263.08	16.26	51.56	80.15	32.54	25.78		
ROYAL ARTILLERY.													
B/E. Bde. Royal Horse Artillery	172	306	3	8	14.33	1779.07	17.44	46.51	98.31	30.58	17.09	Secunderabad, 1, and Bangalore, 11	7 0
C/B. "	162	225	3	5	12.28	1388.89	18.52	30.86	75.80	27.84	19.92	Bangalore, 1, and Secunderabad, 11.	7 0
K/1 " Royal Artillery	164	254	6	9	9.33	1426.83	36.59	54.88	56.89	20.91	14.57	Thayemyo, 11, and Saint Thomas' Mount, 1	10 0
L/1 "	164	167	—	—	10.07	967.31	—	—	61.40	22.41	23.41	Trichinopoly, 11, and on the march, 4	10 0
O/1 "	165	189	2	4	8.17	896.77	13.90	25.81	52.71	19.23	21.45	Saint Thomas' Mount	10 0
D/6 "	153	216	4	4	8.01	1421.05	26.31	26.31	52.70	19.37	13.55	Bangalore	5 9
E/6 "	140	161	4	3	5.77	1150.00	28.67	21.43	41.21	15.03	13.07	Kamptee, and on the march	Not known.
F/6 "	161	205	3	3	10.10	1250.00	18.20	18.20	61.58	22.50	18.00	Secunderabad	Do.
G 6 "	147	245	3	1	12.22	1666.67	20.41	6.80	83.13	30.32	18.20	Bellary, and on the march	Do.
I/6 "	154	213	—	4	14.41	1388.11	—	25.97	63.57	34.15	24.69	Saint Thomas' Mount	1 0

Corps.	Average Annual Strength.	Admitted into Hospital.	Deaths in the Command.	Invalided.	Average Sick.	Ratio per 1,000 of Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the Year.	Years of Service in India.
						Admissions into Hosp.	Deaths.	Invalids.	Average Daily Sick.				
ROYAL ARTILLERY— <i>cont.</i>													
K/6 Bd. Royal Artillery	156	327	4	12	18.97	2006.15	25.64	76.92	121.60	44.38	21.17	Bangalore	months. yrs. mths. 12 2 0
L/6 "	136	312	4	6	10.81	2294.12	29.41	44.11	79.48	29.01	12.04	Kanphee	- 12 1 0
M/6 "	-	25	-	-	.69	1785.71	-	-	40.28	18.07	10.12	Kanphee	- 1 0 1
N/6 "	18	16	-	-	.43	883.88	-	-	23.89	8.78	9.88	Secunderabad	- 1 0 1
O/6 "	17	33	-	1	.87	1941.18	-	58.82	51.18	18.70	9.64	Bellary	- 1 0 1
3/8 "	17	22	-	-	.53	1294.12	-	-	31.18	11.41	8.82	Tonghoo	- 1 0 2
4/8 "	16	29	-	1	.94	1812.50	-	62.50	58.75	21.66	11.90	Thayetmyo	- 1 0 3
7/8 "	16	26	2	-	1.12	1625.00	125.00	-	70.00	26.69	15.81	Tonghoo	- 1 0 2
8/8 "	89	122	1	3	5.30	1370.78	11.24	33.71	59.55	21.74	15.86	Tonghoo	- 12 Not known.
9/8 "	97	113	1	2	4.31	1164.95	10.31	20.62	44.43	16.22	13.93	Tonghoo	- 12 Do.
10/8 "	81	128	7	3	5.58	1580.24	86.42	37.03	68.89	25.13	15.91	Rangoon and Thayetmyo	- 11 13 0
11/8 "	93	161	4	6	6.15	1731.18	43.01	64.52	66.13	24.15	13.05	Rangoon and Thayetmyo	- 12 Not known.
12/8 "	70	92	2	2	2.72	1314.28	28.57	28.57	38.86	14.35	10.92	Madras	- 12 Do.
14/8 "	94	259	-	2	8.41	2755.82	-	21.28	89.47	32.69	11.86	Secunderabad	- 12 Do.
16/9 "	8	14	-	-	.24	1750.00	-	-	80.00	11.12	6.36	Thayetmyo and on the march	- 1 Do.
Total	2,496	3,780	53	79	171.76	1514.42	21.23	31.65	68.81	25.13	16.59		

Corps.	Average Annual Strength.	Admitted into Hospital.	Deaths in the Command.	Invalided.	Average Daily Sick.	Ratio per 1,000 of Strength.				Average Time to each Sick Soldier.	Average Duration of each Case of Sickness.	Stations occupied during the Year.	Years of Service in India.
						Admissions into Hos- pital.	Deaths.	Invalids.	Average Daily Sick.				
INFANTRY.													
2/13th Regiment	548	1,281	11	19	53.56	2337.59	20.07	34.67	106.86	39.08	16.69	Bellary	1 94
Left Wing, 2/13th Regiment	338	686	1	13	32.41	2059.17	2.96	38.46	95.90	35.04	17.00	Bangalore	1 94
2/16th Regiment	879	1,049	7	28	47.04	1198.40	7.96	31.85	53.61	19.54	16.37	Secunderabad	3 94
1/21st Fusiliers	778	1,027	4	41	48.89	1320.05	5.14	52.70	62.84	22.94	17.38	Secunderabad	9 11
33rd Regiment	818	1,070	11	15	43.21	1308.07	13.46	19.34	52.52	19.28	14.74	Kamptee and detachment at Sectabuldee 113 and left for Lucknow.	4 1
43rd "	785	1,096	18	89	51.70	1281.53	22.93	112.10	60.68	25.43	19.55	Madras, 24; Thayetmyo and detachment at Thayetmyo.	7 0
44th "	576	457	20	30	22.38	703.40	34.72	33.94	38.86	14.18	17.88	Thayetmyo	8 1
Left Wing, 44th Regiment	308	191	2	9	9.21	620.13	6.40		20.90	10.90	17.96	Tonghoo	8 1
48th Regiment	724	1,212	10	57	54.69	1574.03	13.81	78.73	75.54	27.57	16.47	Cannmore, detachment at Calicut and Mallisporam.	7 9
54th "	318	438	3	—	16.21	1577.36	9.43	—	50.98	18.00	13.50	Rangoon	8 0
Detachment, 67th Regiment	50	113	3	14	8.27	2260.00	60.00	280.00	165.40	61.05	26.74	Bangalore	7 0
80th Regiment	923	1,215	13	33	49.71	1316.36	14.08	35.75	53.86	19.66	14.93	Rangoon and detachment at Port Blair	9 2
Total	7,045	9,755	103	338	445.28	1384.67	14.62	47.98	63.20	23.07	16.66		
H/1 Brigade, Royal Artillery	—	—	—	1	—	—	—	—	—	—	—	These two invalids were left behind on the departure of their corps in 1878.	
C/6 "	—	—	—	1	—	—	—	—	—	—	—		

**ABSTRACT No. XXIX.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS
TROOPS stationed in the BOMBAY PRESIDENCY during the Year 1879, with**

Orders.	Average Strength, 9,901.		Deaths.			Invalids.		Average Number constantly Sick.*
	Diseases.	Admissions into Hospital.	In the Command.	Of Invalids.	Total.	Number sent Home.	Number finally Discharged the Service.	
	I.—General Diseases.							
	<i>Febrile Group.</i>							
	Eruptive Fevers - - -	3	—	—	—	—	—	·20
	Continued „ - - -	1,110	18	—	18	1	—	28·52
	Yellow Fever - - -	—	—	—	—	—	—	—
	Paroxysmal Fevers - -	11,015	16	—	16	84	1	223·97
	Cholera - - -	2	3	—	3	—	—	·04
	Other diseases - - -	14	—	—	—	—	—	·34
	Total - - -	12,144	37	—	37	85	1	253·07
	<i>Constitutional Group.</i>							
	Rheumatism - - -	363	1	—	1	27	8	16·35
	Primary Syphilis - - -	1,080	—	—	—	—	—	74·40
	Secondary „ - - -	231	—	—	—	19	8	15·63
	Tubercular diseases -	92	10	2	12	42	22	9·38
	Scurvy and Purpura - -	2	—	—	—	—	—	·10
	Other diseases - - -	48	1	—	1	10	2	3·80
	Total - - -	1,816	12	2	14	98	40	119·66
	II.—Local Diseases.							
	<i>Diseases of the—</i>							
1	Nervous System - - -	156	12	1	13	18	10	9·20
2	Eye - - -	142	—	—	—	9	11	6·24
3	Ear - - -	72	—	—	—	4	2	3·54
4	Nose - - -	20	—	—	—	—	—	1·06
5	Circulatory System -	126	9	—	9	38	29	8·20
6	Absorbent „ - - -	208	—	—	—	—	—	16·15
7	Ductless Glands - - -	2	—	—	—	—	—	·14
8	Respiratory System -	601	25	—	25	7	7	26·11
9	Digestive „ - - -	2,125	40	2	42	102	32	77·38
10	Urinary { Gonorrhœa -	1,149	—	—	—	—	—	66·10
	System { Sequelæ of Gonorr.	102	—	—	—	—	2	7·37
	Other diseases - - -	78	4	—	4	4	4	3·58
11	Generative System -	114	—	—	—	—	1	3·88
12	Organs of Locomotion -	25	1	—	1	7	4	2·72
13	Cellular Tissue - - -	168	—	—	—	1	1	8·50
14	Cutaneous System - -	644	—	—	—	6	3	24·22
	III.—Debility - - -	406	1	—	1	213	51	17·34
	IV.—Poisons - - -	92	2	—	2	—	—	1·82
	V.—Injuries.							
1	General - - -	1	6	—	6	—	—	} 28·93
2	Local - - -	922	8	—	8	4	7	
3	In action - - -	—	—	—	—	—	—	—
	No appreciable disease -	16	—	—	—	—	—	·61
	Cause unknown (refers to deaths only).	—	—	—	—	—	—	—
	General Total - - -	21,129	157	5	162	596	205	685·77
	Average for 10 years, 1869–78	—	—	—	—	—	—	—

* The average number constantly sick of the 66th Regiment is not included

† The average ratios for 10 years will be given in future years. The ratios for the year 1879 will be given

into HOSPITAL, DEATHS, NUMBERS INVALIDED and CONSTANTLY SICK† among the Ratios per 1,000 of the Strength, and the Average Ratios for 10 Years.

Ratio per 1,000.					†Average Ratio per 1,000, from 18 to 18 .				
Admis- sions.	Deaths.	Invalids sent Home.	Invalids finally Dis- charged.	Con- stantly Sick.	Admis- sions.	Deaths.	Invalids sent Home.	Invalids finally Dis- charged.	Con- stantly Sick.
.3	—	—	—	.02	—	—	—	—	—
112.1	1.82	.10	—	3.14	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
1112.5	1.62	8.48	.10	} 24.68	—	—	—	—	—
.2	.30	—	—		—	—	—	—	—
1.4	—	—	—		—	—	—	—	—
1226.5	3.74	8.58	.10	27.88	—	—	—	—	—
36.7	.10	2.73	.81	1.80	—	—	—	—	—
109.1	—	—	—	8.20	—	—	—	—	—
23.3	—	1.92	.81	1.72	—	—	—	—	—
9.3	1.21	4.24	2.22	1.03	—	—	—	—	—
.2	—	—	—	.01	—	—	—	—	—
4.8	.10	1.01	.20	.42	—	—	—	—	—
183.4	1.41	9.90	4.04	13.18	—	—	—	—	—
15.8	1.30	1.82	1.01	1.01	—	—	—	—	—
14.3	—	.91	1.11	.69	—	—	—	—	—
7.3	—	.40	.20	.39	—	—	—	—	—
2.0	—	—	—	.12	—	—	—	—	—
12.7	.91	3.84	2.93	.90	—	—	—	—	—
21.0	—	—	—	1.78	—	—	—	—	—
.2	—	—	—	.02	—	—	—	—	—
60.7	2.53	.71	.71	2.88	—	—	—	—	—
214.6	4.23	10.30	3.23	8.52	—	—	—	—	—
116.1	—	—	—	7.28	—	—	—	—	—
10.3	—	—	.20	.81	—	—	—	—	—
7.9	.40	.40	.40	.39	—	—	—	—	—
11.5	—	—	.10	.43	—	—	—	—	—
2.5	.10	.71	.40	.30	—	—	—	—	—
17.0	—	.10	.10	.93	—	—	—	—	—
65.1	—	.61	.30	2.67	—	—	—	—	—
41.0	.10	21.51	5.15	1.91	—	—	—	—	—
9.3	.20	—	—	.20	—	—	—	—	—
.1	.61	—	—	} 3.19	—	—	—	—	—
93.1	.81	.40	.71		—	—	—	—	—
—	—	—	—		—	—	—	—	—
1.6	—	—	—	.07	—	—	—	—	—
—	—	—	—	—	—	—	—	—	—
2134.0	16.34	60.19	20.69	75.55	—	—	—	—	—
1449.8	16.97	40.33	14.30	53.54	—	—	—	—	—

in this Table, as the records of that Corps were lost in Afghanistan.

in the Report for 1880, those for 1879 to 1880 in that for 1881, those for 1879 to 1881 in that for 1882, &c., &c.

ABSTRACT No. XXX.—The following Table, taken from the Report of the Principal Medical Officer, shows the Admissions and Deaths in the Principal Stations in the Bombay Command :—

Military Divisions.	Stations.	Average Annual Strength.	Number of Admissions.	Number of Deaths.	Ratio per 1,000 of the Strength.			
					Admissions.	Deaths.	Average of 10 Years, 1869-78.	
							Admissions.	Deaths.
Presidency Circle.	Bombay	- 680	1,115	11	1639·71	16·18	1923·1	16·30
	Deolali	- 118	305	4	2584·75	33·90	*2344·2	27·16
	Ahmedabad	- 194	551	4	2840·21	20·62	2114·2	26·20
	Deesa -	- 627	609	13	971·13	20·73	1337·0	17·82
	Baroda	- 179	583	1	3256·98	5·59	†1935·3	34·94
	Mount Abou	- 96	226	2	2354·17	20·83	1823·6	17·81
	Kurrachi	- 730	1,868	15	2558·90	20·55	1543·9	14·10
	Hyderabad	- 393	754	3	1918·57	7·63	1499·9	14·31
	Aden -	- 728	850	18	1167·58	24·73	1057·1	14·37
Poona Circle.	Poona -	- 1,310	3,361	9	2565·65	6·87	1375·3	12·54
	Kirkee	- 487	1,078	7	2213·55	14·37	1405·3	11·44
	Ahmednagar	- 279	582	1	2086·02	3·58	1149·9	9·65
	Satara	- 148	409	1	2763·51	6·76	1179·7	12·28
	Purandhar	- 7	—	—	—	—	‡272·7	—
	Belgaum	- 845	1,135	3	1343·20	3·55	1009·9	8·42
Mhow Circle.	Mhow	- 1,167	2,836	12	2430·16	10·28	1652·8	12·27
	Nasirabad	- 599	1,638	22	2724·57	36·73	1872·0	25·92
	Neemuch	- 404	1,751	7	4334·16	17·33	2006·3	31·26
	Indore	- 77	211	1	2740·26	12·99	1536·5	16·93
	Asirgarh	- 103	255	1	2475·72	9·71	1437·9	14·76
	On March	- 419	438	13	1045·35	31·03	874·6	13·10
	Convalescents at Depôts, and Sanitaria	- 268	809	9	3018·66	33·59	2169·1	52·88

* For six years only.

† For four years only.

‡ For one year only.

ABSTRACT No. XXXI.—The following Table, taken from the Report of the Principal Medical Officer, shows the Admissions and Deaths in the various Classes and Orders of Diseases in the Bombay Command :—

Orders.	Military Divisions	Presi- dency.	Poona.		Mhow.		Troops on March.		Conval- escent and Invalids.		Ratio per 1,000.						Troops on March.		Conval- escent and Invalids.										
			3,076		2,350		418		208																				
			Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.											
I. General Diseases.																													
<i>Febrile Group.</i>																													
Eruptive Fevers		1	5	2	123	9	1	5	1	1	124	27	1	34	107	65	53	34	11	96	2	39	130	60	3	75			
Continued "		463		515																									
Yellow Fever																													
Paroxysmal Fevers		3,309	6	3,231	3	4,066	5	75			883	53		1,60	1050	39	98	1725	96	2	13	179	43		1440	30			
Cholera		2	1	1				1			1	60																	
Other diseases		6		5																									
Total of febrile group		3,786	12	3,763	6	4,180	14	81	1	421	1	1010	96	3	20	1220	10	1	96	5	96	133	78	2	39	1570	90	3	73
<i>Constitutional Group.</i>																													
Rheumatism		133		100	1	115		10		19	35	51																	
Primary Syphilis		351		476		170		53		24	93	73																	
Secondary		84		94		36		8		26	22	43																	
Tubercular diseases		32	7	23	3	10		4		6	1	87	1	87	9	10													
Scurvy and Purpura				2								54																	
Other diseases		28	1	16		24	2	1		2		46																	
Total of constitutional group		638	8	716	3	366	2	76		77	1	167	69	2	14	232	77		96	151	49	96	181	62		257	31	3	73

Orders.	Military Divisions	Average Annual Strength	Diseases.	Presi- dency.		Poona.		Mhow.		Troops on March.		Convales- cents and Invalids.		Presidency.		Poona.		Mhow.		Troops on March.		Convales- cents and Invalids.	
				Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
				3,745		3,076		2,350		418		268		Ratio per 1,000 of Strength.									

ABSTRACT No. XXXII.—The following Table, taken from the Report of the Principal Medical Officer, shows the Relation of Enteric Fever to Locality and to Season in the Bombay Command :—

Divisions and Stations.	January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.		Total.	
	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
Presidency Circle -	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-	1	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Poona Circle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Mhow Circle	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-
Admitted -	2	-	1	-	4	-	1	-	4	-	-	-	-	-	4	-	2	-	3	-	6	-	1	-	28	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Died	2	2	-	1	-	-	1	-	2	-	-	1	-	-	-	2	2	-	-	-	1	3	2	-	17	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

ABSTRACT No. XXXIII.—The following Table, taken from the Report of the Principal Medical Officer, shows the Strength, the Number of Admissions and Deaths, and the Invaliding in each Corps and Arm of the Service, and the Ratios of those Numbers per 1,000 of the Strength during the Year in the Bombay Command :—

Corps.	Average Strength.	Admissions into Hospital.			Deaths in and out of Hospital.			Invalids.	Ratio per 1,000.		
		From General Diseases.	From other Diseases.	Total.	From General Diseases.	From other Diseases.	Total.		Admissions.	Deaths.	Invalids.
CAVALRY.											
3rd Hussars - - -	292	228	204	432	1	3	4	6	1479.45	13.70	20.55
17th Lancers - - -	68	28	108	136	—	1	1	—	2000.00	14.71	—
	360	256	312	568	1	4	5	6	1577.78	13.89	16.67
ARTILLERY.											
D/B Royal Horse Artillery -	152	333	113	446	—	1	1	11	2934.21	6.58	72.37
E/B	155	175	105	280	—	2	2	2	1806.45	12.90	12.90
Hd. Qrs. and A/2 Royal Art.	157	294	126	420	1	2	3	13	2675.16	10.11	82.80
B/2 " -	153	75	86	161	2	—	2	9	1052.29	13.07	58.82
C/2 " -	154	206	90	296	2	—	2	7	1922.08	12.99	45.45
E/2 " -	138	336	235	571	1	0	7	22	4137.68	50.72	158.70
F/2 " -	138	234	103	337	—	—	—	3	2442.03	—	21.74
G/2 " -	150	419	135	554	—	2	2	8	3693.33	13.33	53.33
Late 6th Brigade Royal Art.	1	—	1	1	—	—	—	1	1000.00	—	1000.00
5/8 " -	85	89	52	141	1	1	2	11	1658.82	23.53	129.41
13/8 " -	80	183	75	258	1	—	1	7	3225.00	12.50	87.50
15/8 " -	80	17	47	64	—	—	—	3	800.00	—	37.50
17/8 " -	85	91	80	171	—	—	—	5	2011.76	—	58.83
18/8 " -	77	14	35	49	—	—	—	4	636.36	—	51.95
19/8 " -	76	62	45	107	—	1	1	5	1407.89	13.16	65.79
1/9 " -	69	13	28	41	—	2	2	2	594.20	28.99	28.99
8/11 " -	74	50	51	101	1	—	1	6	1364.86	13.51	81.06
Staff 1st Brigade Royal Art. -	5	2	—	2	—	—	—	—	400.00	—	—
I/1 " -	101	150	78	228	—	4	4	4	2257.43	39.60	39.60
M/1 " -	144	400	100	500	2	1	3	23	3472.22	20.83	169.72
N/1 " -	158	82	77	159	1	3	4	10	1006.33	25.32	63.29
	3,232	3,225	1,662	4,887	12	25	37	156	2189.52	16.58	69.89
Royal Engineers (Bombay Sappers and Miners).											
	42	4	3	7	—	—	—	—	166.67	—	—
INFANTRY.											
1/2nd Queen's - - -	106	79	59	138	—	—	—	—	1301.89	—	—
1/6th Foot - - -	83	100	134	234	2	14	16	—	2819.28	192.77	—
1/14th " - - -	457	195	333	528	1	6	7	23	1155.36	15.32	50.33
2/7th " Right Wing -	473	401	305	706	2	7	9	58	1682.88	19.03	122.62
" Left Wing -	357	485	204	689	1	1	2	18	1929.07	5.60	50.48
2/11th " - - -	887	2,121	711	2,832	4	4	8	73	3192.78	9.02	82.30
2/15th " - - -	871	935	522	1,457	6	9	15	44	1672.79	17.22	50.52
2/17th " - - -	815	1,670	744	2,414	10	10	20	72	2961.96	24.54	17.18
29th " - - -	715	1,496	529	2,025	2	5	7	14	2832.17	9.79	19.58
66th " - - -	823	1,362	479	1,841	1	15	16	33	2246.94	19.56	40.10
78th " - - -	744	898	603	1,501	4	1	5	28	2017.47	6.72	37.64
83rd " - - -	936	642	574	1,216	3	7	10	71	1299.15	10.68	75.85
	7,267	10,474	5,197	15,671	36	79	115	434	2156.46	15.82	59.72
	9,901	13,959	7,174	21,133	49	108	157	596	2134.43	15.86	60.20

ABSTRACT No. XXXIV.—The following Table, taken from the Report of the Principal Medical Officer, shows the comparative Mortality and Invaliding in the Three Grades of Commissioned Officers, Non-commissioned Officers, and Privates during the Year under Report, and for the Ten previous Years in the Bombay Command :—

Years.	Average Strength.			Number of Deaths.			Invalided.			Ratio per 1,000.					
	Commissioned Officers.	Non-commissioned Officers.	Privates.	Commissioned Officers.	Non-commissioned Officers.	Privates.	Commissioned Officers.	Non-commissioned Officers.	Privates.	Deaths.			Invalids.		
										Commissioned Officers.	Non-commissioned Officers.	Privates.	Commissioned Officers.	Non-commissioned Officers.	Privates.
1869 -	520	1,245	9,292	1	32	195	45	35	228	1·92	25·70	20·98	86·54	28·11	24·54
1870 -	517	1,211	9,346	5	26	147	46	42	319	9·66	21·47	15·73	88·97	34·66	34·13
1871 -	496	1,216	9,620	5	33	118	37	27	219	10·08	27·05	12·27	74·59	22·20	22·17
1872 -	443	1,199	9,699	10	32	173	34	30	282	23·55	26·69	17·84	76·75	25·02	29·03
1873 -	397	1,150	9,523	7	16	109	38	47	379	17·63	13·91	11·44	95·72	40·87	39·80
1874 -	385	1,139	9,439	1	16	97	27	65	376	2·59	14·05	10·28	70·13	57·07	39·88
1875 -	363	1,163	9,170	7	33	181	33	55	573	11·02	28·37	19·74	90·91	47·29	62·49
1876 -	368	1,173	9,111	5	18	110	43	49	433	13·59	15·27	12·07	116·85	41·56	47·52
1877 -	375	1,160	8,989	4	18	108	35	63	427	10·67	11·21	12·01	93·33	54·31	47·50
1878 -	364	1,316	8,588	3	34	166	44	86	492	8·24	25·84	19·33	120·88	63·35	57·29
Average for 10 years	423	1,197	9,278	5	25	140	38	50	373	11·35	21·13	15·13	90·35	41·68	40·18
1879 -	373	1,382	8,502	3	21	136	20	75	521	8·04	16·38	15·99	53·62	58·50	61·28

ABSTRACT No. XXXV.—TABLE showing the AVERAGE STRENGTH, ADMISSIONS and returning from FOREIGN SERVICE, and proceeding

Orders.	Strength of N.C.O. and Men :			Passage Out.		Passage Home.		Intercolonial.	
	Embarked - - -			25,880		11,579		6,894	
	Average Annual Strength - - -			2,326		1,181		616	
	Diseases.			Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
	I.—General Diseases.								
	<i>Febrile Group.</i>								
	Eruptive Fevers - - -	-	-	1	—	6	—	—	—
	Continued „ - - -	-	-	47	—	41	3	21	—
	Yellow Fever - - -	-	-	—	—	—	—	—	—
	Paroxysmal Fevers - - -	-	-	5	—	228	3	2	—
	Cholera - - -	-	-	2	—	—	—	—	—
	Other diseases - - -	-	-	8	—	3	—	—	—
	Total - - -	-	-	63	—	278	6	23	—
	<i>Constitutional Group.</i>								
	Rheumatism - - -	-	-	54	—	20	—	14	1
	Primary Syphilis - - -	-	-	258	—	48	—	41	—
	Secondary „ - - -	-	-	37	—	8	—	1	—
	Tubercular diseases - - -	-	-	12	1	7	1	3	—
	Scurvy and Purpura - - -	-	-	1	—	1	—	—	—
	Other Diseases - - -	-	-	9	—	2	—	1	—
	Total - - -	-	-	371	1	86	1	60	1
	II.—Local Diseases.								
	<i>Diseases of the—</i>								
1	Nervous System - - -	-	-	21	2	10	3	3	1
2	Eye - - -	-	-	31	—	5	—	4	—
3	Ear - - -	-	-	6	—	1	—	—	—
4	Nose - - -	-	-	1	—	—	—	1	—
5	Circulatory System - - -	-	-	4	—	1	2	2	—
6	Absorbent „ - - -	-	-	36	—	11	—	7	—
7	Ductless Glands - - -	-	-	—	—	—	—	—	—
8	Respiratory System - - -	-	-	158	5	43	4	16	—
9	Digestive „ - - -	-	-	208	—	85	3	28	1
	Urinary { Gonorrhœa - - -	-	-	269	—	35	—	23	—
10	System { Sequelæ of Gonorrhœa - - -	-	-	20	—	4	—	2	—
	Other diseases - - -	-	-	19	—	10	—	11	—
11	Generative System - - -	-	-	34	—	—	—	3	—
12	Organs of Locomotion - - -	-	-	7	—	3	—	1	—
13	Cellular Tissue - - -	-	-	62	—	26	—	9	—
14	Cutaneous System - - -	-	-	262	—	36	—	41	—
	III.—Debility.								
	IV.—Poisons.								
	V.—Injuries.								
1	General - - -	-	-	1	1	1	1	—	—
2	Local - - -	-	-	167	—	44	1	29	—
3	In action - - -	-	-	—	—	—	—	—	—
	No appreciable disease - - -	-	-	1	—	—	—	—	—
	Cause unknown (refers to deaths only).	-	-	—	—	—	—	—	1
	General Total - - -	-	-	1,768	10	696	21	264	4
	Average of 10 years 1869-78 -	-	-	—	—	—	—	—	—

into HOSPITAL, and DEATHS among the TROOPS on BOARD SHIP, proceeding on from one Colony or Foreign Command to another.

Ratio per 1,000.					
Passage out.		Passage Home.		Intercolonial.	
Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
·4	—	5·1	—	—	—
20·2	—	34·7	2·54	34·1	—
—	—	—	—	—	—
2·2	—	193·1	2·54	3·2	—
·9	—	—	—	—	—
3·4	—	2·5	—	—	—
27·1	—	235·4	5·08	37·3	—
23·2	—	16·9	—	22·7	1·62
110·9	—	40·7	—	66·6	—
15·9	—	6·8	—	1·6	—
5·2	·43	5·9	·85	4·9	—
·4	—	·8	—	—	—
3·9	—	1·7	—	1·6	—
159·5	·43	72·8	·85	97·4	1·62
9·0	·86	8·5	2·54	4·9	1·62
13·3	—	4·2	—	6·5	—
2·6	—	·8	—	—	—
·4	—	—	—	1·6	—
1·7	—	·8	1·69	3·2	—
15·5	—	9·3	—	11·4	—
—	—	—	—	—	—
67·9	2·15	36·4	3·38	26·0	—
89·4	—	72·0	2·54	45·5	1·62
115·7	—	29·6	—	37·3	—
8·6	—	8·4	—	3·2	—
8·2	—	8·8	—	17·9	—
14·6	—	—	—	4·9	—
3·0	—	2·5	—	1·6	—
26·7	—	22·0	—	14·6	—
112·6	—	30·5	—	66·6	—
11·2	—	10·1	—	—	—
·4	·43	4·2	—	1·6	—
·4	·43	·8	·85	—	—
71·8	—	37·2	·85	47·1	—
—	—	—	—	—	—
·4	—	—	—	—	—
—	—	—	—	—	1·62
760·0	4·30	589·3	17·78	428·6	6·48
476·1	4·93	500·4	13·04	769·7	12·52

ABSTRACT No. XXXVI.—ON THE INFLUENCE OF AGE ON THE MORTALITY.—Table showing the death-rates of the Non-commissioned Officers and Men at the several Ages, arranged by quinquennial periods in the several Foreign Commands.

Commands.	Under 20 Years.			20 and under 25.			25 and under 30.			30 and under 35.			35 and under 40.			40 and upwards.									
	Strength.	Ratio per 1,000.		Strength.	Ratio per 1,000.		Strength.	Ratio per 1,000.		Strength.	Ratio per 1,000.		Strength.	Ratio per 1,000.		Strength.	Ratio per 1,000.								
		Died.	1879.		1868-78.	Died.		1879.	1860-78.		Died.	1879.		1860-78.	Died.		1879.	1860-78.	Died.	1879.	1860-78.				
Gibraltar	-	346	1	2'80	1'37	2,075	17	8'19	3'29	1,463	12	8'04	5'47	555	4	7'21	7'39	413	2	4'84	8'77	172	1	5'81	18'90
Malta	-	514	3	5'84	3'03	2,421	21	8'67	7'34	1,390	5	3'60	8'06	483	3	6'21	10'87	317	2	6'31	13'25	103	2	19'42	13'06
Cyprus	-	11	0	-	*	169	4	23'67	*	249	5	30'08	*	92	1	10'87	*	28	0	-	*	12	0	-	*
Canada	-	81	0	-	1'17	656	2	3'05	5'31	611	2	3'27	4'56	187	1	5'35	10'56	118	1	8'47	12'71	86	1	10'53	19'61
Bermuda	-	174	0	-	1'31	732	2	2'73	6'26	443	4	9'03	9'44	266	4	10'63	16'61	201	0	-	30'71	79	0	-	30'46
West Indies	-	64	1	15'63	8'10	446	4	8'97	12'73	373	1	2'68	10'72	100	3	30'00	18'52	88	1	11'36	9'15	22	0	-	61'83
Cape of Good Hope and St. Helena.	-	†	†	†	2'66	†	†	†	5'31	†	†	†	7'77	†	†	†	13'37	†	†	†	23'13	†	†	†	12'63
Mauritius	-	17	0	-	8'55	199	6	30'15	14'29	108	1	9'26	30'86	73	0	-	30'65	23	0	-	15'21	7	2	235'71	16'95
Ceylon	-	20	0	-	1'76	343	8	23'32	12'30	342	1	3'92	19'42	82	0	-	17'02	71	5	70'42	29'11	33	1	30'30	83'89
China and Straits Settlements.	-	43	0	-	2'75	783	3	3'83	6'53	504	2	3'97	11'38	231	3	12'99	13'68	137	2	14'60	24'98	31	0	-	32'13
India	-	1,768	15	8'46	7'65	16,964	409	24'25	15'43	16,068	397	24'71	17'90	7,100	200	23'17	24'71	4,191	116	27'68	30'46	1,317	68	51'63	54'34

* This information cannot be given.

† As the Principal Medical Officer at the Cape has not been able to furnish the necessary statistics, this information cannot be given.

ABSTRACT No. XXXVII.—The various Corps which served in the Foreign Commands during the year, and some of the most important of their Health Statistics, are shown in the following Table :—

Corps and Commands.	Com- pleted Years of Service in the Com- mand.	Average Annual Strength.	Admitted into Hospital.	Died.			Invalids sent Home.	Average Number Con- stantly Sick.	Ratio per 1,000 of Strength.				Average Time to each Soldier.	Average Duration of each Case of Sick- ness.	
				In the Com- mand.	Of Invalids.	Total.			Ad- mitted.	Died.	In- vali- dated.	Con- stantly Sick.			
GIBRALTAR.															
Royal Artillery	5	369	649	6	2	8	66	46.56	656.2	8.09	66.73	47.09	17.18	26.18	
Royal Engineers	—	330	164	4	—	4	12	8.92	612.5	12.49	37.50	27.83	10.17	10.85	
1st Battalion, 4th Foot	4	18	5	—	1	1	—	1.11	277.8	55.66	—	61.67	22.51	81.03	
2nd " 33rd "	5	615	316	3	—	3	18	24.06	613.8	4.88	20.26	39.16	14.29	27.81	
42nd Foot	—	268	874	9	2	11	132	41.50	3361.2	41.04	492.54	154.85	56.63	17.33	
71st "	1	576	937	5	1	6	47	40.00	1630.2	10.42	81.60	69.44	25.36	15.53	
79th "	—	303	220	1	—	1	5	13.76	723.0	3.31	16.87	45.66	16.63	22.83	
93rd "	1	634	473	3	—	3	19	23.05	768.0	4.81	30.44	36.94	13.43	17.79	
102nd "	2	38	27	—	1	1	17	3.96	710.5	26.32	447.37	103.95	37.94	53.40	
2nd Battalion, Rifle Brigade	5	646	290	4	1	5	13	18.35	448.9	7.74	20.12	28.39	10.37	23.10	
Detachments of Infantry	—	—	2	—	—	—	1	.45	—	—	—	—	—	—	
Army Service Corps	—	63	17	2	—	2	1	1.31	269.8	31.74	15.87	20.79	7.59	28.13	
Army Hospital Corps	—	46	29	—	—	—	4	2.03	604.2	—	83.33	42.29	15.44	25.55	
Garrison Staff	—	9	1	—	—	—	—	.13	111.1	—	—	14.44	5.27	47.45	
MALTA.															
Royal Artillery	6	954	853	7	—	7	63	49.77	869.4	7.34	66.05	53.17	19.04	21.17	

Corps and Commands.	Com- pleted Years of Service in the Com- mand.	Average Annual Strength.	Admitted into Hospital.	Died.			Invalids sent Home.	Average Number Con- stantly Sick.	Ratio per 1,000 of Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sick- ness.	
				In the Com- mand.	Of Invalids.	Total.			Ad- mitted.	Died.	In- vali- dated.	Con- stantly Sick.			
MALTA—cont.															
Royal Engineers	—	193	163	—	1	1	4	7.73	844.6	5.18	20.70	40.05	days.	17.31	
1st Battalion, 1st Foot	1½	742	805	4	—	4	21	46.48	1084.9	5.39	23.28	62.64	22.86	21.07	
2nd „ 10th „	1½	636	554	8	—	8	9	23.15	871.1	12.53	14.15	44.26	16.15	18.55	
1st „ 20th „	—	173	163	—	—	—	4	8.27	942.2	—	23.12	47.80	17.45	18.52	
27th Foot	2½	28	10	—	—	—	—	1.42	357.1	—	—	50.72	18.51	51.83	
35th „	—	541	461	8	—	8	9	17.98	852.1	14.79	16.64	33.24	12.13	14.24	
61st „	1½	673	549	3	1	3	25	30.16	815.8	4.46	37.17	44.81	16.36	20.05	
98th „	4	653	473	5	—	5	16	25.33	726.5	7.60	24.32	38.50	14.05	19.34	
Detachment of Infantry	—	2	1	—	1	1	—	10	500.0	500.00	—	50.00	18.25	36.50	
Army Service Corps	—	11	2	—	—	—	1	15	181.8	—	90.91	13.64	4.98	27.37	
Army Hospital Corps	—	52	29	2	—	2	3	2.07	557.7	33.46	57.69	39.81	14.53	26.05	
Garrison Staff	—	5	—	—	—	—	—	—	—	—	—	—	—	—	
CYPRUS.															
Royal Engineers	1	179	442	9	1	10	12	13.9	2405.1	55.87	67.04	77.65	23.34	11.48	
1st Battalion, 20th Foot	1	417	463	1	—	1	8	18.3	1117.5	2.89	19.18	43.89	16.02	14.33	
42nd Foot	—	—	—	—	1	1	1	—	—	—	—	—	—	—	
71st Foot	—	—	—	—	—	—	1	—	—	—	—	—	—	—	

Corps and Commands.	Com- pleted Years of Service in the Com- mand.	Average Annual Strength.	Admitted into Hospital.	Died.			Invalids sent Home.	Average Number Con- stantly Sick.	Ratio per 1,000 of Strength.				Average Duration of each Case of Sick- ness.	
				In the Com- mand.	Of Invalids.	Total.			Ad- mitted.	Died.	In- val- idated.	Con- stantly Sick.		
CYPRUS--cont.														
101st Foot	-	-	-	-	1	1	-	-	-	-	-	-	days.	-
Army Service Corps	-	28	28	-	1	1	3	1.2	1000.0	33.71	107.14	42.86	15.64	15.64
Army Hospital Corps	-	26	29	-	-	-	-	1.7	1115.4	-	-	65.38	23.87	21.40
Garrison Staff	-	10	5	-	-	-	-	.6	500.0	-	-	60.00	21.90	43.80
CANADA.														
10th Brigade, Royal Artillery	3½	392	134	2	1	3	3	7.40	443.7	9.83	9.83	24.50	8.04	20.16
Royal Engineers	-	90	43	-	-	-	2	2.07	433.4	-	20.20	20.91	7.63	17.57
1st Battalion, 20th Foot	-	6	2	-	-	-	1	.07	333.3	-	166.67	11.67	4.26	12.78
97th Foot	3	635	482	2	-	2	12	25.78	711.8	3.14	18.86	40.00	14.82	20.82
101st "	1	637	1,055	2	-	2	39	47.09	1608.2	3.04	69.46	71.67	26.16	16.29
Detachment of Infantry	-	1	1	-	-	-	-	.03	1000.0	-	-	30.00	10.95	10.95
Garrison Staff, &c.	-	20	14	1	-	1	-	.51	492.8	34.48	-	17.59	6.42	13.30
BRITISH INDIA.														
Royal Artillery	3	194	67	-	-	-	-	3.41	343.4	-	-	17.53	6.42	18.68
Royal Engineers	-	427	273	2	-	2	4	17.37	639.3	4.68	9.37	40.68	14.85	23.22
1st Battalion, 19th Foot	3	653	509	4	-	4	4	27.98	779.5	6.13	6.13	42.85	15.64	20.06
46th Foot	4	621	294	3	-	3	10	20.57	473.4	4.88	16.10	33.12	12.09	25.54

Corps and Commands.	Com- pleted Years of Service in the Com- mand.	Average Annual Strength.	Admitted into Hospital.	Died.			Invalids sent Home.	Average Number Con- stantly Sick.	Ratio per 1,000 of Strength.				Average Sick Time to each Soldier.	Average Duration of each Case of Sick- ness.	
				In the Com- mand.	Of Invalids.	Total.			Ad- mitted.	Died.	In- vali- dated.	Con- stantly Sick.			
BERMUDA—cont.															
Army Service Corps	3	53	24	1	—	1	1	1.55	452.8	18.87	18.87	29.25	10.67	23.57	
Army Hospital Corps	—	21	8	—	—	—	—	.24	380.9	—	—	11.43	4.17	10.95	
Garrison Staff	—	1	—	—	—	—	—	—	—	—	—	—	—	—	
WEST INDIES.															
9th Brigade, Royal Artillery	4	96	113	2	1	3	3	5.03	1177.1	31.25	31.25	52.40	19.12	16.25	
10th "	4	94	68	2	—	2	7	4.75	723.4	21.28	74.47	50.53	18.44	25.50	
Royal Engineers	—	11	3	1	—	1	—	.42	273.7	90.91	—	38.18	13.94	51.10	
1st Battalion, 4th Foot	1	745	459	5	—	5	—	21.28	616.1	6.71	—	28.56	10.40	16.88	
35th Foot	3	74	22	—	—	—	16	3.11	287.3	—	216.22	42.03	15.34	51.90	
West India Regiments	—	16	10	—	—	—	—	.10	625.0	—	—	6.25	2.28	3.65	
Army Hospital Corps	—	14	6	—	—	—	2	.35	428.6	—	142.86	25.00	9.13	21.29	
Garrison Staff	—	20	5	—	—	—	1	.08	250.0	—	50.00	4.00	1.46	5.84	
} As no information was received from the Cape of Good Hope, the usual Table cannot be furnished for this year.															
CAPE OF GOOD HOPE AND ST. HELENA.															
MAURITIUS.															
7th Brigade, Royal Artillery	3½	77	209	1	—	1	8	7.36	2714.3	13.99	103.89	95.63	34.89	13.85	
88th Foot	1	188	687	6	—	6	14	20.16	3654.2	31.92	74.47	107.23	39.14	10.71	

Corps and Commands.	Com- pleted Years of Service in the Com- mand.	Average Annual Strength.	Admitted into Hospital.	Died.			Invalids Sent Home.	Average Number Con- stantly Sick.	Ratio per 1,000 of Strength.				Average Time to each Soldier.	Average Duration of each Case of Sick- ness.	
				In the Com- mand.	Of Invalids.	Total.			Ad- mitted.	Died.	In- valids.	Con- stantly Sick.			
MAURITIUS—cont.															
91st Foot	—	64	152	2	—	2	—	4.38	2375.0	31.25	—	68.44	days. 24.98	10.52	
Garrison Staff, &c.	—	19	11	—	—	—	2	.51	578.9	—	105.26	26.84	9.80	16.92	
CEYLON.															
7th Brigade, Royal Artillery	3	196	104	1	—	1	6	9.76	989.8	5.10	30.61	49.80	18.18	18.36	
Royal Engineers	2	5	5	—	—	—	1	.39	1000.0	—	200.00	78.00	28.47	28.47	
57th Foot	5	110	101	2	1	3	9	6.26	918.2	27.27	81.82	56.91	20.77	22.62	
102nd "	1	558	739	12	—	12	9	33.04	1324.4	21.51	16.13	59.21	21.61	16.32	
Army Hospital Corps	4	12	2	—	—	—	—	.10	166.7	—	—	8.33	3.04	18.25	
CHINA AND THE STRAITS SETTLEMENTS.															
Royal Artillery	—	177	147	—	—	—	11	8.35	830.5	—	68.15	47.18	17.22	20.73	
Royal Engineers	—	22	10	—	—	—	—	.58	454.5	—	—	26.36	9.62	21.17	
2nd Battalion, 3rd Foot	—	54	65	—	—	—	—	.70	1208.7	—	—	12.96	4.73	3.93	
27th Foot	—	721	708	5	1	6	27	45.84	982.0	8.32	37.45	63.68	23.21	23.63	
28th "	3	174	131	1	—	1	3	5.51	752.9	5.75	17.24	31.67	11.56	15.35	
74th "	3	701	672	4	2	6	32	38.56	938.6	8.56	45.65	55.01	20.08	20.94	
Army Hospital Corps	—	18	7	—	—	—	2	.38	388.9	—	111.11	21.11	7.71	19.81	
Garrison Staff	—	9	2	—	—	—	—	.15	222.2	—	—	16.67	6.08	27.38	

ABSTRACT No. XXXVIII.—The following Table taken from the Report of the Principal Medical Officer at Madras, shows the comparative Mortality and Invaliding in the Three Grades of Commissioned Officers, Non-commissioned Officers, and Privates, for the Year under Report and for the Ten previous Years.

Years.	Average Strength.			Number of Deaths.			Invalided.			Ratio per 1,000.					
	Commissioned officers.		Privates.	Commissioned officers.		Privates.	Commissioned officers.		Privates.	Deaths.		Invalids.		Commissioned officers.	Privates.
	Non-commissioned officers.	Commissioned officers.		Non-commissioned officers.	Commissioned officers.		Non-commissioned officers.	Commissioned officers.		Non-commissioned officers.	Commissioned officers.	Non-commissioned officers.	Commissioned officers.		
1869 -	408	1,732	9,027	8	40	207	61	41	532	19.61	23.09	22.93	149.51	23.67	58.93
1870 -	414	1,758	9,387	3	47	175	53	57	770	7.25	26.73	18.64	128.02	32.42	83.03
1871 -	444	1,699	9,428	4	40	174	58	51	401	9.01	23.54	18.45	130.63	30.01	42.53
1872 -	430	1,723	10,021	7	51	166	37	44	392	16.28	29.60	16.56	86.05	25.54	39.11
1873 -	422	1,785	10,180	6	24	187	37	42	367	14.22	13.44	18.87	87.68	23.53	36.05
1874 -	419	1,785	10,215	3	27	122	33	48	555	7.16	15.12	11.94	78.76	26.89	54.33
1875 -	398	1,698	9,779	11	32	131	38	61	532	27.64	18.84	13.39	95.48	35.92	54.89
1876 -	405	1,670	9,671	7	31	143	34	65	413	17.28	18.56	14.79	83.95	38.92	42.70
1877 -	454	1,700	9,641	6	46	142	33	63	447	13.22	27.05	14.73	72.69	37.59	46.85
1878 -	442	1,665	9,491	9	55	178	29	57	411	20.36	38.03	18.75	65.61	34.23	46.46
Average for 10 years -	423	1,721	9,684	6	39	162	41	53	485	15.20	22.66	16.72	97.89	30.80	50.08
1879 -	433	1,660	9,744	3	33	140	26	63	405	6.93	19.88	14.36	60.05	37.35	41.56

HOME STATIONS.

SANITARY REPORT.

Aldershot.

Surgeon-General D. A. MacKinnon remarks that "the per-centage of sick *United Kingdom.* to strength, for the period under consideration, has been less than for the previous 18 years.

"The prevailing diseases have been those peculiar to home stations, rheumatic and respiratory affections, the per-centage to strength being 3.75 and 6.60 respectively.

"The per-centage of strength to admissions for primary syphilis and gonorrhœa to all other forms of disease has been higher than those of the previous six years. This increase is no doubt due to importation from unprotected districts, and also to the fact that men do not conceal the disease since the fine has ceased to be levied.

"The troops may fairly be said to have enjoyed an immunity from dysentery and diarrhœa, the admissions from both forms of disease having been less than at any other period of which there is a record here. This is all the more remarkable when the proximity of the sewage farm to the North Camp is considered.

"The sanitary improvements which have been effected during the year are as follows:—All the drains from the latrines in the East, West, South Cavalry, East Centre and West Infantry Barracks, and the Royal Artillery, and Royal Horse Artillery Barracks have been ventilated by means of 4-inch pipes carried from drain to top of roofs. Also the main foul drain near the corner of the Riding School, West Cavalry Barracks, has been ventilated.

"The new barrack rooms which have been for some time in course of erection over the stables of the Royal Horse Artillery have been completed and occupied by men of that corps, affording accommodation for 277 non-commissioned officers and men. The construction of the rooms is all that could be desired in a sanitary point of view, the cubic space and superficial area being according to regulation. Each room is equipped for 24 men, is well lighted and ventilated, with an ablution room and night urinal shut off from it. In the huts the average cubic space to each man in the North and South Camp has been a fraction below the minimum allowance by regulation. The hospital accommodation has been the same in every respect as reported during the last 18 years.

"In July the Cambridge Hospital was opened for the reception of patients, and the offices for the use of the Administrative Branch of the Department. It provides accommodation for 268 sick, inclusive of four officers. The better accommodation and modern sanitary appliances will, no doubt, tend to the recovery and expedite the convalescence of the occupants.

"The general sanitary condition of the camp and quarters has been fairly preserved. No disease has been traced to the sewage farm, but unpleasant odours have been experienced in its vicinity, especially when the direction of the wind has come from that quarter. The drainage of the northern and eastern boundaries of the North Camp admit of much improvement, the ground being low and swampy. Further extension of drainage along the Lynchford Road is also urgently required, and improvement in the conservancy arrangements of the civil population in the neighbourhood. This locality may prove a source of danger on the invasion of epidemics and consequent spread of disease.

"Notwithstanding that the disturbances at the Cape required the removal of many medical officers and men of the Army Hospital Corps to the seat of war, and necessary reliefs were made to other foreign stations, there was no duty left undischarged. The medical officers obtained their privilege leave in turn, and the station hospital system did not press heavily on any one. Occasionally difficulties would arise at times in consequence of sudden transfers of medical officers to other stations, but this inconvenience only lasted for short periods. On the whole the administration was successfully carried out, and was alike creditable to the founder and to those engaged in its execution."

*United
Kingdom.*

Eastern District.

Deputy Surgeon-General R. Gilborne remarks:—"The following sanitary defects were noted at Surgeon-Major Wallis' (Acting P.M.O.) half-yearly inspection. At Shoeburyness, malaria is very prevalent, recommended drainage of the marsh. At Bedford, the River Ouse is frequently in flood and holds back the sub-soil drainage, and keeps the soil more or less saturated. At Lincoln prisoners' room not drained. At Ipswich the drainage throughout the barracks is old and on a very imperfect system.

"The condition of the vicinities of the camps, barracks, and hospitals in the district with the exception of the above stations is reported to be good in regard to drainage.

"Numerous minor sanitary improvements have been effected during the year at the barracks at Colchester. Ipswich, and Bury St. Edmunds."

"The effects of gymnastic training on the health of the troops is reported favourably of."

South-eastern District.

Deputy Surgeon-General J. Hendley, C.B., observes that "the reports from the various medical officers are generally satisfactory as regards the health of the troops in their respective charges, and the sanitary conditions.

"Only at Hythe is there, it would appear, any local or special cause affecting the health of the troops. A recently constructed canal by interfering with the natural drainage appears to have increased the prevalence of ague in Hythe and its neighbourhood.

"The want of a hospital for females and children at Dover has been much felt, and often strongly urged. A recent suggestion for the conversion of an existing building may meet with approval.

"Defects in the latrine accommodation and management at the married quarters, Western Heights, have been represented, and improvements have been effected or are under consideration.

"The construction of new quarters, near the hospital, at the Western Heights, Dover, giving excellent accommodation to five married men of the Army Hospital Corps, is an important service, as it leaves the hospital quite free for the sick and their attendants.

"At *Shorncliffe* some drains and cesspit latrines reported against have been put into order, the latter removed and others substituted. Improvements effected in the warming and ventilation of the cells and prisoners' room.

"At *Canterbury* the various recommendations have been complied with, and amongst others a ward adapted to the accommodation of lunatics.

"At *Maidstone* there has been some trouble about the urinal, which is in a fair way of being remedied. The officer in medical charge reports an improved state of drainage and sewerage in the town.

"At *Brighton* improvements in drainage, earthclosets, &c. have been sanctioned. The great prevalence of venereal disease is noticed.

"A new system of warming and ventilating the cells and prisoners' room has been introduced at Chichester.

"The effect of gymnastic training is everywhere reported favourably of."

Chatham District.

Deputy Surgeon-General George Pain, remarks that "the sanitary condition of the several barracks is fairly good, though it is advisable that the old brick drains should be replaced by glazed earthenware drain pipes.

"The following have been the principal sanitary improvements executed during the past year:—

"At *Gravesend*, alteration of field officers' quarters in New Tavern Fort.

"At *Sheerness*, ventilation of main drain near officers' quarters, providing a ceiling, and improving ventilation in sergeants' mess.

"At *Chatham*, alteration to watercloset soil pipes, Broughton Barracks; providing dry earthcloset for servants and improving drainage, Government

House; providing separate cisterns to latrines, &c. in nine different quarters, *United Kingdom.* and a dry earthcloset in provost quarter; replacing old watercloset by Jennings' patent, and providing watercloset to servants' quarters at the Commissariat Depôt; measures taken to prevent dampness in field officers' quarters; laying on water to closet in rear of smith's shop; converting privy into dry earthcloset at the Gun Wharf; converting privy into dry earthcloset at the Sally Port; converting privy into dry earthcloset at the Spur Battery.

"The revision of the drainage of Chatham Barracks is in hand.

"A number of sanitary improvements have been proposed for next year."

Home District.

Deputy Surgeon-General F. Holton reports:—"The barracks generally are in a very satisfactory condition. In the new barracks at Hounslow, as well as those at Kingston-on-Thames, Reading, Oxford, and Guildford, the barrack rooms are made to accommodate 28 men, and are, in my opinion, too long. During the winter season they are never fully occupied, and as fuel is issued in accordance with the occupation it is scarcely sufficient to maintain one fire, consequently the rooms are never sufficiently warmed. I have recommended that a partition should be put up in the centre of each room, which I have no doubt would render them more comfortable.

"At Hounslow the want of hospital accommodation for women and children and for infectious diseases is much felt.

"I have recommended that a building just outside the hospital enclosure, at present used as an infant school, should be converted into a female hospital.

"At Reading some difficulty is at times experienced with the sewage, the barracks being built in such a low-lying situation that there is hardly sufficient fall."

Woolwich.

Deputy Surgeon-General F. Holton, M.B., reports that "the general health of the troops in the district has been good during the past year. It is satisfactory to note that there was only one case of enteric fever, compared with 11 last year.

"Syphilis was in excess of the previous year, due to the change of regiments, in addition to imported cases, and in some measure to ignorance on the part of the men as to the women with whom they cohabit.

"The inclemency of the season all through has caused many bronchial and lung affections.

"Nothing can be more satisfactory than the condition, management, &c. of the Herbert Hospital, which reflects the greatest credit on the medical officer in charge.

"The sanitary condition of the barracks, married quarters, &c. has been very good.

"The following are the principal sanitary services performed by the Royal Engineer Department during the year:—

"1st. A new outfall sewer has been laid, in order to drain the basement of the five field officers' quarters on the Common.

"2nd. Old pattern grates have been removed from the soldiers' barrack-rooms in the Grand Depôt (formerly R.E.) Barracks, and Galton's ventilating grates substituted for them, with inlets for fresh air.

"3rd. Waste and overflow pipes from sinks and cisterns have been disconnected from the underground drains in the field officers' quarters on the Common.

"4th. The same services have been performed at the three ridingmasters' quarters in Nightingale Vale, and a dry area constructed round the basement of the building."

United
Kingdom.

Southern District.

Surgeon-General C. A. Gordon, C.B., observes that "no alterations requiring any special remark have been made during the year, either in space accommodation or drainage, &c., and the condition of the vicinities of barracks and hospitals generally appears to be satisfactory.

"Gymnastic training where facilities exist is carried out with beneficial results."

Netley.

Surgeon-General H. Massy, C.B., reports:—"The registrar's annual report and returns are forwarded herewith, from which the following abstract is obtained:—

TABLE I.—INVALIDS.

Distribution.	Remained.	Admitted.	Died.	Discharged			Remaining 31st December 1879.
				Inva- lided.	To Duty.	To Lunatic Hospital.	
From Foreign Sta- tions.	107	3,773	42	1,620	2,014	2	205
Men sent for change.	4	13	2	6	6	—	3

TABLE II.

Years.	Remained from pre- vious Year.	Admitted dur- ing Year.	Total treated.	Died.	Ratio per 1,000.	To duty with Corps.	Ratio per 1,000.	Discharged the Service.	Ratio per 1,000.
1876	127	2,472	2,599	38	14·62	1,125	432·4	1,377	530·0
1877	56	2,527	2,583	61	24·13	1,240	483·5	1,181	457·6
1878	91	2,935	3,026	30	9·91	1,284	424·3	1,605	530·4
1879	107	3,776	3,883	42	10·8	2,014	518·7	1,620	417·7

TABLE III.—EFFECTIVES.

Corps, &c.	Average Annual Strength.	Remained in Hospital 31st December 1878.	Since Admit- ted.	Died.	Duty.	Invalided.	Remaining in Hospital 31st December 1879.
Army Hospital Corps	119	6	82	2	66	2	8
Army Service Corps	27	1	3	—	3	—	—
Staff, &c.	19	1	1	—	1	—	—
Discharge Depot	177	61	277	7	274	15	42

"It will be seen from the foregoing tables that the admissions from foreign stations during 1879 were considerably in excess of the previous three years. This was due to the war at the Cape, 1,240 invalids having arrived at Netley during the year from South Africa.

"There was no great difference from the year 1878 in the ratio per 1,000 of deaths, but the ratio of men discharged to duty was distinctly more in 1879 than in either of the previous three years. This was owing to a considerable proportion of the arrivals from the Cape and Natal having been found fit to

join the depôts of their regiments on, or soon after, reaching this country. It seems that many of these men, who had suffered from fevers, dysentery, or pulmonary affections, were detained so long in South Africa before embarkation for England that they had, to a great extent, recovered from the actual disease for which they were invalided, and, though unfit for service from debility, they were nearly quite well on reaching home.

"Arrival of Ships.—I have, in the reports for the years 1877 and 1878, remarked upon the inconvenience attendant upon the arrival of the ships with invalids from India within a short period of each other, rendering it most difficult, in fact, at times impossible, to provide accommodation for the men and their families. In 1879 the 'Malabar,' 'Euphrates,' and 'Jumna' arrived respectively on the 7th, 10th, and 16th May, bringing 1,140 invalids. Had there been a fortnight's interval between the arrival of these ships no difficulty would have been experienced in providing for the invalids they brought. I would refer to my remarks in previous years for further discussion on this subject.*

"Quarters.—I would beg to point out the inadequacy of the quarters at Netley for surgeons on probation and medical candidates. Only about 44 quarters can be counted upon, in addition to a house hired by the Admiralty, which accommodates eight more, making 52 in all.

"Now taking the requirements of the Army Medical Department, Indian and Naval Medical Services, the wants in the future are likely to considerably exceed the number of quarters available for the accommodation of the gentlemen on probation of the three services. It has often been proposed to build additional quarters, and about two and a half years back the site was actually undergoing preparation by the Royal Engineers for their construction, but the work was not proceeded with. I would urge the construction of these quarters, as, when the numbers are in excess of the existing quarters, the provision in substitution is only a makeshift one.

"During the winter, when wards in the hospital were vacant, candidates were placed in them, but it is obvious that such an arrangement is altogether wrong, and during the summer season no wards could be made available for such a purpose, all being required for their legitimate use, the treatment of the sick.

"The other source of accommodation available is the hiring of lodgings. This is objectionable in the first place, as only a few and very inferior lodgings can be obtained at Netley, and the village of Netley is inhabited exclusively by soldiers and sailors and their associates, and to place young gentlemen in such a locality is, in my opinion, submitting them to conditions which are very unadvisable and should be avoided.

"Lodgings at Woolston or Southampton would take them too far from their duties, and deprive them of the advantages of the mess, besides removing them from the discipline which is a most essential part of the education of those about to enter the public service."

Western District.

Deputy Surgeon-General J. Lamprey remarks that, "Venereal diseases constitute by far the largest number of admissions to hospital during the year. This is, no doubt, moderated to a certain extent by the enforcement of the Contagious Diseases Act in Devonport and Plymouth districts, where the largest number of troops are quartered; and if the same Act could be enforced in other localities where troops are stationed, judging by experience, there would be a greater reduction of this class of disease.

"Bronchitis, tonsillitis, and rheumatism are next in point of frequency. These diseases are attributable to the humid and changeable nature of the climate, to obviate which every precaution as regards clothing and warming of rooms, has been taken when necessary, and it is difficult to see what more could be done in this respect.

"No epidemic visited this district excepting an outbreak of measles among the children of the married soldiers, who suffered considerably in the Devonport garrison.

* These views have been met by new regulations, which have provided for the dispatch this year of a proportion of the invalids early in the season.

United Kingdom.

"The sanitary improvements consist of drainage works for conducting the sewage, which at present falls into the Creek lying between Devonport, Plymouth, and Stoke, into the sea at some distance off.

"New barracks are being constructed at Trowbridge, new latrines and urinals have been made at Newport and Pendennis Castle, and new barrack rooms have been substituted for old ones at Topsham, and better ventilation and drainage made. The barrack rooms at Pendennis Castle and Brecon have also been better ventilated. A new drill shed and improvement in hospital latrines has been made at Pembroke Dock, besides minor repairs and alterations throughout the district.

"The drainage of the camps at Hay, Okehampton, and Avonmouth has been very defective. The troops suffered great discomfort in consequence, though without any apparent detriment to their health. The gymnastic exercises have proved beneficial to health."

Northern District.

Surgeon-General Sir A. D. Home, V.C., K.C.B., remarks that, "The chief condition injuriously affecting the health of the troops at a station in this district during the year occurred in consequence of there being a double supply of water, one for drinking and cooking, and one—a restricted one—for flushing stables and drains, and for use in case of fire. The result was that the exceedingly impure water stored in tanks and derived from the rainfall gathered on the roofs of certain buildings at Sheffield was used largely by the men in some of the barrack rooms there, producing diarrhoea of a very severe kind, the illness being fatal in one instance. The remedy recommended and adopted by the military authorities was the absolute disuse of the second source of water supply, and this at once averted further mischief.

"In three of the instances in which soldiers in this district were attacked with enteric fever, it seems probable that the men were attacked in consequence of something affecting them when on the line of march, but the cause was not clearly established.

"At Beverley, the main drain was examined in consequence of the backward flow of sewage, this was remedied and better ventilation was at the same time given. At Pontefract (like that at Beverley new barracks) more ventilation was given at the junction of the main drain with that of the town sewer; this was effected in April, after some time a syphon trap was placed near the junction. A source of danger in the drainage system of all those of similar design is the reception of the excreta from the married quarters into the slop sinks which depend for flushing on water thrown into them; unless careful attention is given the water carriage thus provided is insufficient.

"Wrexham.—The water-closet drain in one building was cut off from connexion with the waste water pipe of the cistern. Several unused cesspits were discovered and filled up. Water-closets in hospital were reformed on a better plan.

"Castletown, Isle of Man.—Latrines were ventilated.

"The drainage of the barrack yard at Burnley was greatly improved, and the officers' quarters were very thoroughly examined for insanitary conditions. At many barracks in the district minor repairs and alterations have been carried out, more extensive than in most years on account of the great injury accruing from the action of the severe frosts on the systems of water pipes.

"Hospital accommodation.—There are few stations in the district in which this is ample; in some it is exceedingly restricted, as at Northampton, Weedon, Birmingham, Leeds, Chester, and Bradford.

"The pressure is chiefly felt when the Militia are called out for training. It is necessary to fit up barrack rooms for the reception of patients at most of the stations referred to. A new hospital has been sanctioned at Northampton and an enlargement at that of Leeds."

North British District.

Deputy Surgeon-General J. Sheldon Furlong reports, "The climate of the year 1879 was ungenial; there was no summer, and the winter set in early and

very severely. The health of the troops apparently was not so good as in 1878. The admissions and deaths per 1,000 of strength were as follows:— *United Kingdom.*

—		1878.	1879.
Admissions -	-	752·97	803·67
Deaths -	-	7·98	10·45

“However, in 1878 the Reserve men were called out, and being healthy they gave few admissions to hospital, so the proportion to strength would be lower that year from this cause alone.

“There was no epidemic amongst the troops. Measles were so in the children at Maryhill and Glencorse, but not of a fatal character.

“The rations have been generally good and the cooking well done and varied, very much according to the taste of the men. For a short time in the early part of the year $\frac{3}{4}$ lb. of preserved meat was served one day in the week in lieu of fresh, and $\frac{1}{2}$ lb. biscuit and $\frac{1}{2}$ lb. bread twice weekly. There were no complaints about them.

“*Warning.*—On the whole fair, but in the severe weather the troops at many stations were obliged to purchase coal in addition to the increased allowance.

“*Water.*—The water is good, the supply regular all over the district when the water pipes are in order; but at many stations this has not been the case. The system pursued by the barrack sergeants of turning off the water in the winter months, by the way of saving waste, is in reality a waste of water and money, especially the latter. It is well known, and acted upon in Canada, that the only efficient way of keeping the water pipes unfrozen in the winter is to allow the taps at a distance from the main to flow a little, just enough to keep up a movement in the pipe.

“*Edinburgh Castle.*—The medical officer reports favourably on the general sanitary condition of the Castle. In some points improvement is required; one is, ventilation to the gas burners by inverted funnels with tubes leading to the open air. A second, re-arrangement and enlargement of the cook-house behind the crown square. A third, the old ablution room near this cook-house, in which at present there is one bath, to have three more fitted in it, and a boiler to supply hot water in winter. These services will be put in the estimates 1880-1.

“*Castle Hospital.*—The hospital is in good sanitary condition. There is not any contagious ward properly so called, but two cases of scarlet fever were treated successfully in a small ward without any extension of the disease.

“*Piershill.*—No change in barracks or hospital during the year. Several minor sanitary requirements will be included in the estimates for 1880-1.

“*Leith Fort.*—Barracks and hospital in good order and no change during the year. Steamers for kitchen boilers were supplied out of canteen fund and give general satisfaction.

“*Glencorse.*—The sanitary condition has improved. The men’s latrine behind the Douglas Barracks has been re-modelled, but the non-commissioned officers’ and the women’s have not yet been done.

“Concrete surface drains are being laid down and the drainage generally attended to.

“*Blackness.*—The extension of the sewage-pipes has been done. A hospital has been built, but has not yet been handed over.

“*Aberdeen.*—Militia barracks have been thoroughly drained and the very offensive latrine altered. All are now in good sanitary condition.

“Regular barracks and hospital in good sanitary condition. The lighting of the latter was bad, but has been improved upon representation.

“*Fort George.*—The medical officer considers that some more efficient way of flushing the upper part of the main drain should be adopted, as from the little fall there is towards the sea it has become foul.

“Filtered water has not yet been supplied direct to the hospital, but the works are in preparation. The erection of a new mortuary and conversion of

*United
Kingdom.*

the present one into a foul linen store would be of great advantage; it will be put into the estimates.

"*Perth.*—A bath room with slate baths has been provided in the west wing. The latrines and urinals for the east wing are of old construction and situated too close to the hospital, and rather far from the barracks. It would be of great advantage to build new ones.

"*Stirling.*—The medical officer reports that the old system of rain-water drainage has been opened up and thoroughly repaired. The ventilating sewer pipes have been lengthened as recommended, also a plan drawn to improve the sergeants' mess.

"*Hamilton.*—Improvements in the barracks, &c. have been carried out.

"The only drawback in the hospital is the annual freezing of the water pipes, which causes inconvenience.

"*Maryhill.*—The remarks made in last annual report upon the sanitary condition of the vicinity of these barracks could all be repeated this year.

"Long correspondence and even public meetings took place concerning the disposal of the sewage flowing into the Possil Burn and Kelvin, but no practical results followed.

"The great defects in the barracks are also the same, viz., the inefficiency and bad construction of the night urinals in the infantry barracks, and the freezing of all water pipes in 1879 as in 1878.

"Some improvements were made: a large and commodious well-furnished gymnasium was opened, and an instructor sent. The medical officer reports that the effect upon some 136 of the men taught was favourable to their health and physical development. This is the only regular gymnasium in the district.

"The ventilating pipes to the water-closets in the officers' quarters were lengthened with manifest advantage, and a considerable portion of the ground around the barracks levelled and drained.

"*Montrose.*—The old county lunatic asylum has been hired for the Forfar Artillery Militia, and was occupied for the first time this year. The drainage requires to be looked to, and old sewers which have become filled opened up, particularly behind the officers' quarters."

Dublin District.

Deputy Surgeon-General J. E. Moffatt, officiating Principal Medical Officer, observes "there have been few alterations or improvements in the barracks or hospitals of the district during the year 1879, owing to the want of funds so universally experienced throughout the country; and with regard to those in Dublin, no changes have been reported in Richmond, Portobello, Aldborough House, Beggars' Bush, or Ship Street Barracks.

"*At Island Bridge,* in consequence of some cases of enteric fever, the drains were overhauled, and one was found to be completely choked with filth, they are reported now to be in perfect order, but I have lately perceived the main drain flowing into the Liffey to be affected by the tide, which I do not consider satisfactory, and I intend to propose a sluice-gate at the mouth.

"*At the Royal Barracks,* also, in consequence of the occurrence of some cases of enteric fever in the officers' quarters, cavalry barracks, I ordered these quarters to be thoroughly examined by a medical board, but nothing particularly insanitary could be discovered. The quarters on the east side of the square have undergone an extensive internal alteration and repair, the drains have been carefully examined, and the recommendations of the medical board been carried out. But there has been a case of enteric fever of much severity since the commencement of the year 1880, in the west side of the same square, the source of which is by no means apparent.

"*Newbridge.*—Here the barrack accommodation needs re-adjustment, there being insufficient room for single men, in consequence of several of their rooms, capable of holding 10 or 11 men each, being given over to married staff-sergeants, who thus have much more room than they require. The medical officer recommends woollen jerseys for use at stables. Better ventilation for tailor's shop recommended.

"*Curragh*.—Nothing particular to be noted. The new concrete huts are *United Kingdom* complained of as being damp, and are not so well liked by the men as the old wooden ones that admit rain and wind. The concrete takes a long time to dry, and the dampness will disappear in time.

"*Naas*.—Extensive quarters for married families are building, and nearly completed.

"*Athlone*.—Two cases of mild enteric fever and one of typhus occurred, but cannot be attributed to any tangible sanitary defects.

"*Birr*.—The cesspit privy in the cells is undergoing reconstructions, and a system connecting all the latrines and urinals with the main drain is to be carried out this year.

"*Mullingar*.—The mortuary requires water laid on, and the construction of a sink.

"*Galway*.—The new barracks are nearly completed, and will probably be occupied this year."

Belfast District.

Deputy Surgeon-General J. Sinclair observes, "the sanitary reports from the various stations in the Belfast District are, on the whole, satisfactory, no sickness is attributed to insanitary conditions. The cleanliness of the different barracks is carefully attended to, the means of ventilation sufficient, the lighting and warming satisfactory, except in very cold weather, when extra fuel is absolutely necessary for the health and comfort of the men, and has always been sanctioned when recommended.

"The clothing and bedding is good, and the food is favourably reported on. The water supplied to the barracks is, for the most part, the same as that supplied to the town population. At Armagh and Londonderry it is not very good, but steps are being taken by the local civil authorities to improve it.

"The huts at Armagh are old and almost unfit for occupation, they are frequently crowded on account of the number of recruits exceeding the accommodation; it is contemplated to build new barracks and remove the old huts.

"The 12 huts in the barrack square are in a similar condition, they ought also to be removed, but I do not think it desirable that officers' quarters should be built on their present site. I am of opinion the space should be left vacant for parade purposes.

"At present these barracks are quite surrounded by the houses of the town, and open-air spaces are most desirable in the vicinity of the barracks. No new buildings should be erected here, an open country site should be chosen instead.

"The proximity of the towns to the barracks in this district is very objectionable, and it is in consequence almost impossible to keep out the infectious diseases of the civil population, measles and scarlet fever are so introduced by direct communication.

"The duties have not been severe, in very cold weather the night sentries were relieved every hour, and hot coffee supplied to them.

"The Contagious Diseases Act is not in force at any of the stations in this district; the amount of venereal is large at Belfast. The only gymnasium is at Belfast, the medical officer there reports that the training has had a beneficial effect upon the health and strength of the young soldiers.

"The following sanitary improvements, alterations, &c. have been carried out during the past year:—

"*Armagh*.—Field officers' quarters and barracks, House No. 1, provide waterclosets; officers' stable, remove dung pit from front of officers' mess, and divide ashpit in coal yard.

"*Belfast*.—Soldiers' cook-house, provide steel oven for 200 men.

"*Cavan*.—Underground tank, repair, leakage, and remove pump 15 feet.

"*Dundalk*.—Additional accommodation for regimental sergeant-major.

"*Enniskillen*.—New barracks, converting women's wash-house into sergeants' mess kitchen, and erecting new wash-house; enlarging canteen tap-room.

*United
Kingdom.*

"*Queen Street Barracks.*—Provide separate waterclosets for boys and girls.

"*Redoubt.*—Provide Jennings' latrines, increase ablution and bath-room in hospital.

"*Londonderry.*—Erect married soldiers' quarters, improve ventilation of cells, furnish hospital ward No. 3 with ventilator.

"*Newry.*—Provide separate waterclosets for boys and girls.

"*Belfast.*—Provide night urinal to prisoners' room."

Cork District.

Deputy Surgeon-General J. A. W. Thompson reports that "the health of the troops has been excellent, and, with the exception of Fermoy, in which station enteric fever assumed an epidemic form, I had not to make any sanitary suggestions worth noting.

"*In Fermoy* I recommended that the men should be restricted in their intercourse with the civil community, that certain portions of the town should be placed "out of bounds," and that the very strictest supervision should be kept over the water, and the milk and butter tendered for sale to the troops. All my recommendations received prompt attention, and they were probably of considerable effect in moderating the violence of the epidemic.

"An outbreak of enteric fever occurred in the 103rd R.B. Fusiliers in Cork, it was clearly imported, as its outbreak took place almost immediately after the regiment reached Cork from Fermoy, and it did not extend beyond those at first attacked.

"It is at any time a difficult matter to clearly assign a distinct cause for enteric fever, but more particularly is difficulty met with in such well-kept and carefully conserved barracks as those in the Cork District. Possibly in most of the cases observed amongst soldiers the fever is due to association with the civilians who reside in small, ill-ventilated, and probably fever stricken houses, in which every article of food and drink is, to a great extent, infected.

"The admissions for venereal disease were much as in the previous year. The Contagious Diseases Act proved of considerable benefit in those stations in which it was enforced.

"There was no overcrowding worth mentioning during the year, and certainly none to which any disease could be attributed.

"Very few improvements have to be remarked upon, owing chiefly to the almost universal completion of the "dry-earth" latrines, and improvements in drainage during the year previous to that under observation. One "dry-earth" latrine in the Island of Rocky has been substituted for the exceedingly offensive cesspit which had hitherto existed.

"The means of ablution, as in previous years, are sufficient and sufficiently used.

"Drainage generally approved of, no complaints under this head of any importance or to any extent bearing on the sanitary condition of the different barracks were made during the year.

"The worst feature connected with many of the barracks in the Cork District is the disagreeable, if not dangerous immediate proximity of dirty, ill-drained, and unsewaged suburbs.

"*Gymnasia*, four in the district, practice in which has been attended with excellent results in health, physique, and setting up."

FOREIGN STATIONS.

SANITARY REPORT.

Gibraltar.

Surgeon-General Huntly G. Gordon, M.D., reports that "no special causes of sickness have been either brought to notice or observed during the period. *Foreign Stations.*

"The past season has been a healthy one, but the returns of the station have been disarranged by the amount of sickness imported from Cyprus by the 42nd Highlanders and 71st Highland Light Infantry.

"The leading sanitary services performed by the Royal Engineer Department in 1879 were as follows:—

"*Windmill Hill Barracks.*—Bath rooms added to ablution rooms.

"*Europa Infantry Barracks.*—Bath rooms added to ablution rooms.

"*Europa Defensible Barracks.*—Three rooms floored with wood.

"*Buena Vista—Stone block.*—Two bath rooms added, and means of private ablution increased.

"*Jumpers Bastion.*—Latrine accommodation increased.

"*King's Bastion, Retrenchment, Married Quarters.*—Increased ventilation throughout. Bath, washing and ironing rooms fitted up.

"*North Front.*—Earth closets now supplied with dry earth instead of sea sand, as formerly.

"*Station Hospital.*—Latrines at south of hospital remodelled and improved. Stoves supplied to infectious wards, also to detention and prisoners' wards. Foul water drains supplied with strainers. Waterclosets generally placed in thorough repair.

"Gymnastic training as carried out is good for the health of the men."

Malta.

Surgeon-General W. G. Watt reports:—"As I leave the Command before the several medical officers' returns and reports are furnished to me, I am unable to state whether their reports are in accordance with my own observations and experiences.

"In reviewing, however, the sickness, mortality, and invaliding of the troops this year as compared with the previous one, I am very pleased to record that there is a very large reduction, particularly in enteric fever, which disease last year was very prevalent, a large number of cases proving fatal.

"It is useless for me to offer any suggestions that may appear to improve the health of the troops, as the most important matter in the way of good sanitation for the Island, and particularly for Valetta and the Three Cities, is still under the consideration of the Imperial and Colonial Government, and when the measures proposed are fully carried out there is no doubt that there will be a mitigation of such diseases as are the result of defective sanitary laws.

"An infectious hospital for women and children has been opened during the year for four beds in the Valetta Station Hospital, as well as a recreation room for the Army Hospital Corps.

"*Forrest Hospital* has likewise received many improvements in the way of better accommodation for ablution purposes, improved ventilation and light, &c., and the grounds of the hospital, which were hitherto rented to a Maltese, have been handed over to the Medical Department.

"Owing to the sickness being very low during the year, it has not been found necessary to open the Sanitarium.

"During the prevalence of fever amongst the civil population at the Mandaraggio (which is quite adjacent to the Marsanuisceetti Barracks), I recommended the reduction of the strength of the Detachment Royal Artillery to

Foreign Stations.

admit of a larger amount of superficial area per man. The troops during the hot summer months discontinued wearing their valises when mounting guard, &c., and likewise the waist belt and side arms were discontinued to be worn by orderlies and non-commissioned officers when on ordinary duties.

"The two gymnasia appear to be appreciated by the troops, and tend greatly to the benefit of their health as well as to their amusement.

"The following comparative table shows the sickness, mortality, and invaliding per 1,000 to strength for the last 10 years, exclusive of the Royal Malta Fencible Artillery:—

Years.	Average Strength.	Admissions.		Deaths.		Invalids.	
		No. Admitted.	Ratio per 1,000.	No. Died in Hospital.	Ratio per 1,000.	No. Invalids.	Ratio per 1,000.
Average for 5 years (1870-74).	5,147	4,509	875·60	41	7·90	133	25·80
1874 - - -	4,466	3,924	878·60	31	6·90	127	28·40
1875 - - -	4,506	4,064	906·54	36	7·90	152	33·74
1876 - - -	4,539	3,644	802·80	40	8·81	95	20·92
1877 - - -	5,556	4,963	896·80	38	6·8	105	18·8
1878 - - -	6,201	5,537	892·92	57	9·19	303	48·86
1879 - - -	4,668	4,073	872·53	29	6·21	155	33·20

"*Improvements effected during the year.*—A slight improvement has been made in the ventilation of the schoolroom of Upper St. Elmo Barracks.

"A skylight has been added to the clerks' room, commissariat office. The ventilation of No. 4 commissariat stables has been improved.

"More light has been given to the canteen, St. Francis Barracks, Floriana. The ventilation of the kitchen in the military prison has been improved.

"The ventilation of the quarters at the gate of the military prison has been improved.

"*Water Supply.*—A new tank has been provided for married quarters, C. block, Pembroke Camp.

"A new tank for 200,000 galls. has been provided for St. Clement's Retrenchment. A few more tanks have been fitted with charcoal filters.

"*Lighting.*—Additional gaslight has been provided to the schoolroom Upper St. Elmo Barracks.

"*Latrine and Ablution Accommodation.*—The latrine of Middle Yard, St. Francis Barracks, Floriana, has been removed and a new one provided in a better position.

"A urinal has been provided to the officers' mess, Fort Manuel.

"The latrines at Vittoriosa Barracks have been removed and reconstructed.

"*Drainage.*—The large works for the main drainage of Valetta and the Three Cities are in progress, those in the Three Cities being nearly completed, but those in Valetta not yet commenced.

"A drain has been provided for the buildings in the ditch at Fort Tigné.

"The outfall of the drain at Fort Tigné into the sea has been improved.

"The yard of the canteen at Isola Gate Barracks has been drained.

"The drainage of the Commanding Royal Engineer's quarters has been improved.

"*Warming and Cooking.*—A new kitchen range has been provided to the sergeants' mess, Fort Manuel.

"A fireplace has been provided for the sergeants' mess, Fort Ricasoli.

"A cooking range has been provided for the cells of the garrison guard room at San Francisco di Paolo."

*Cyprus.**Foreign
Stations.*

Surgeon-Major F. Falwasser, the senior medical officer, reports "the health of the troops during 1879 compares very favourably with that of the previous year.

"The 1/20th Regiment, who were new-comers, had a much lower sick rate than the 31st Company Royal Engineers who had been in the island since its first occupation, and who had been, of necessity, much exposed to the influences of climate in road-making and other urgent public works."

He speaks in warm terms of the hill station of Platris, 3,500 feet above sea level, and Mount Troados, 5,600, which were occupied by the greater portion of the troops during the summer months.

"The officers and men were quartered in Indian pal tents, huts being erected for the hospital, women, and children.

"The water supply was good and abundant, but having to be brought uphill on donkeys, was very expensive.

The rations were indifferent, the native mutton being described as tough and poor; the beef imported was of a better description. Fruit and vegetables were good and plentiful.

"In October the troops were sent down to Polymedia, a new cantonment three miles from Limasol, which promises to be healthy and suitable as a permanent residence. Huts have been erected, and it is contemplated to build permanent barracks and so avoid the great expense of transport in moving the garrison every hot season to the mountains."

Dominion of Canada.

Deputy Surgeon-General G. A. F. Shelton reports "the average strength of the garrison was 1729·53 non-commissioned officers and men.

"The number of admissions to hospital was 1,701, showing an increase of 689 over those in 1878.

"The excess is chiefly attributable to sickness by fever in the 101st Regiment, which disease, though modified in severity each month successively, continued to prevail in that corps until the month of August, at which period the regiment may be said to have almost completely regained its efficiency. During the latter portion of the year venereal diseases prevailed to an unusual extent among the troops in garrison, showing a per-centage during some weeks of 45 and even 50 of all cases treated.

"The same remark applies, I learn, to the sailors of the fleet during its stay in Halifax. The greatest vigilance was exercised by the police towards the prevention of soldiers entering streets proscribed, and this, combined with the advent of severe weather, caused a sensible diminution of the disease.

"Diphtheria, from which disease the troops and their families had hitherto enjoyed almost complete immunity for years, occurred to a fatal extent. The disease was almost exclusively confined to the Royal Artillery and Royal Engineers, and almost as exclusively to children.

"In the month of April, four children of Lieut. Walker quartered in the Artillery Park Barracks were seized with this disease and died in four days; subsequently, Lieut. Walker himself was attacked most severely, but recovered sufficiently to be invalided to England.

"In the month of May, an outbreak took place, confined altogether to the children of the Royal Artillery and Royal Engineers.

"The disease was attributed to infection introduced into the school of the Royal Artillery in the Artillery Park Barracks, and to the existence of a very imperfect system of latrines. The school was closed, the dry earth system of latrines was without delay introduced and with good effect.

"The second outbreak in July was altogether confined to the east side of the pavilion married quarters, and, as in the former case, to the children of the Royal Artillery and Royal Engineers there quartered, and to one child of a staff-sergeant.

"The surface drainage was found defective, and new drains, and a ventilating shaft were at once constructed.

Foreign Stations.

"Of a total of 31 attacked with diphtheria, 14 proved fatal.

"The want of a hospital for infectious diseases is much felt at this station, as the patients were of necessity received into the clock tower and into marquees in the hospital precincts, both indifferent alternatives.

"The following improvements and alterations have been effected :—

"*Garrison Hospital Kitchen*.—Provide additional accommodation.

"*Garrison Hospital Medical Servants' Quarters*.—Remove interior and provide exterior porches.

"*Citadel Barracks*.—Officers' quarters, pave and drain area.

"*Casemates*.—Improve light in rooms.

"*No. 2 Cook Store*.—Provide oven.

"Provide bread and meat store and ablution room.

"Renew six baths and repair drains.

"*Pavilion Married Quarters*.—Women's latrines, provision of cast-iron syphon traps with ventilating shafts; provision of slop sinks and improve water supply during winter.

"*Men's Latrines*.—Provision of cast-iron syphon traps with ventilating shafts and provision of slop sinks.

"*Laundry*.—Provision of cast-iron syphon traps.

"*Quarters generally*.—Provision of ventilating shaft 23 feet high; waste gratings at hydrants disconnected from sewer clearing pipes.

"Reconstruction of ventilating flues.

"*Commissariat Office*.—Introduce water.

"*Barrack Stores*.—Introduce water in yard.

"*George's Island*.—New guard room and fire-engine shed; pump to tank (Glacis).

"*Ive's Point Battery*.—Pump to well.

"*Fort Ogilvie*.—Pump to well.

"*Prince of Wales' Tower*.—Pump to well.

"*Cambridge Battery*.—Pump to well.

"*McNab's Island*.—Formation of rifle range.

"*Royal Artillery Park and South Barracks, &c.*—Provision of dry earth closets.

"*Belle Vue House*.—Provision of dry earth closets.

"*Glacis and Citadel Barracks*.—Protect flushing apparatus from frost.

"*Glacis Barracks, Blocks 1 and 2*.—Latrines; provision of cast-iron syphon traps, with ventilating shafts; cleaning out man-holes, brick pits, and pipes.

"*Station Hospital*.—Provision of cast-iron syphon traps with ventilating shafts. Ventilating shaft to sewer constructed. Disconnecting old unused pipe inside building. Cleaning out sewer in front of building.

"*Garrison Institute*.—Constructing trap and fixing ventilating shaft.

"The several barracks and tributary buildings are now in a fair sanitary condition, in good repair, afford sufficient accommodation for their occupants, and are well lighted, warmed, and ventilated, except a few rooms (casemated) in the citadel.

"The drainage is on the whole satisfactory, but some untrapped drains in the vicinity of the pavilion married quarters and near the mess house of the 97th regiment exist; but these being under the civil authorities, the difficulty of effecting an improvement is considerable.

"The baths and lavatories are in full use and are well supplied with basins; separate bathing rooms, gratings, and water in abundance laid on from taps, all in good condition.

"The guard rooms and day rooms are now well warmed.

"The clothing of the men is in every respect suitable to the nature of the climate, except the great coat, which being of thin material and only partially lined does not afford sufficient warmth during inclement weather. Its weight exclusive of the cape is 4½ lbs. This subject is at present engaging the attention of the general commanding.

"There is a well-found gymnasium where the men are systematically instructed under trained guidance, exercising a favourable influence on health and strength.

"The sanitary officer in his annual report takes exception to the perfectness of the system of training, both as to the length of time occupied in such and the nature of the exercises, and is of opinion that it is not conducive to health.

He further considers that the gymnasium is unfit for occupation owing to its surroundings and an absence of proper ventilation, but while I consider that much is desirable to render the building complete, I cannot endorse his views as to either the system being bad, or that the building should be condemned. Perhaps, if a larger number of men were trained and for a shorter period than 13 weeks, advantage might arise.

"Recreations are abundant, billiard and bagatelle tables, ball and racquet courts, skittles, skating rink, a theatre, &c., contributing largely to the contentment of the soldier.

"The canteens are excellently stocked, and are most carefully supervised as to the quality of the articles sold and their price. They are extensively made use of and are clean and well conducted.

"The barracks are each well situated, nor is there any source of malaria in their vicinity, but there are certain imperfections in the drainage resulting from incomplete town sewerage, as before observed.

"The hospital is well placed, both as a centre and in a sanitary point, is in good repair, clean, well lighted, and warmed, and affording ample accommodation.

"The garden is kept in good order and affords a cheerful ground for exercise for the patients.

"I am much indebted to the medical officers of the garrison for their untiring zeal under pressure of unusual sickness in the 101st Regiment for some months at the commencement of the year, and again during the outbreak of diphtheria before adverted to."

Bermuda.

Deputy Surgeon-General T. O'Leary reports "that the general health of the troops has been very good. The limitation in the hours of labour on the public works during the hottest part of the year has been attended with beneficial results.

"The following sanitary works have been carried out during the year:—

- "1. A new latrine provided for guard room at Prospect.
- "2. An urinal for canteen at Prospect.
- "3. Foul water sinks for married quarters at Prospect.
- "4. Improved water supply at Prospect.
- "5. New latrine for station hospital at Prospect.
- "6. New urinals for officers' quarters, Royal Engineer barracks, St. George's.
- "7. New traps to drains generally at St. George's.
- "8. New drains established at Boaz.
- "9. Children's latrine constructed at Boaz.
- "10. Ventilation of married quarters improved at Boaz."

West Indies.

Deputy Surgeon-General Stanhope Fasson reports that "a comparison of the sick returns of this year with those of the preceding annual period shows that during 1879 the general health of the white troops in the West India Command was in every way an improvement on that of its predecessor (1878).

"With the exception of five cases of enteric fever, which occurred at Newcastle, Jamaica, between October 9th and November 1st, or in a space of 23 days, and to account for which a searching inspection failed to show any local insanitary cause, there has been no epidemic or endemic disease at any station in the Command during the year.

"Barracks.—The white troops have continued to occupy the same barracks as during the year preceding, with the exception that owing to the very insanitary state of the town of Port Royal, Jamaica, the half battery of Royal Artillery which used to form part of the garrison was at the commencement of the year moved to Newcastle and replaced by West India troops.

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"At Port Royal the barrack is of old date and faulty construction in regard to the barrack blocks being so relatively placed to each other as to interfere with their ventilation. With this exception, the barrack accommodation generally may be reported to be very good.

"*Ventilation.*—At Newcastle, Jamaica, the ventilation of the huts upon the lower part of the spur of the hill upon which the cantonment is built has been improved; these huts are built upon "plateaux," to form which the ground had to be deeply scarped, and with a first regard probably to economy of site, these scarps had been made to rise perpendicularly about three feet only from the rear face of the hut to a level in some instances as high as the hut itself, and thus ventilation was seriously impeded. Observing this on my first annual sanitary inspection of Newcastle, I recommended that this should be improved by the perpendicular scarp being sloped away, or if that should be deemed impracticable, owing to its endangering the foundations of the huts next above, that the huts on each alternate platform should be removed, by which the "plateaux" of those left standing could be enlarged and free ventilation ensured. The former of these recommendations has since been carried out and considerably, if not sufficiently, to the improvement of the ventilation of the huts. I may here remark that the short epidemic of yellow fever which prevailed at Newcastle in 1877 was mainly localised in these huts.

"The Station hospitals are constructed upon sanitary principles well adapted to the climatic conditions of the western tropics, they have afforded ample accommodation for the sick as regards cubic space and surface area; they have been well administered with a punctilious regard to cleanliness and the preservation of proper hygienic conditions, and as might consequently be anticipated, in no instance has disease resulting from insanitary influences been traced to have originated in an hospital.

"The water supply, &c. has been without change during the year, derived either from stored rain water, rivers, or springs, the quality has been reported good and the quantity sufficient.

"The means of ablution have been ample in the shape of basins and fixed baths with continuous water supply, and in addition at two stations, viz., Up Park Camp, Jamaica, and at Trinidad of a large plunge bath with running water, a luxury thoroughly appreciated by the men, as also by the women and children for whom its use during a portion of each day has been reserved. At those stations which are on the sea coast, or within range of a desirable river for the purpose, bathing parades have been carried out regularly twice or oftener in the week.

"The drainage has been generally reported as satisfactory. At Newcastle, Jamaica, certain of the surface drains have been improved in accordance with the recommendation mentioned in my last annual report.

"The conservancy arrangements at the several stations have been reported to be satisfactory. At certain of the same the 'dry earth' system has been in operation, and when properly carried out has worked well; but it requires great attention on the part of those placed in charge of it, and, in order to such attention being given, 'watchful supervision' over the same.

"*Means of Recreation and Gymnastic Exercises.*—Each barrack occupied by white troops has had a 'recreation room' supplied with games, newspapers, periodicals, &c., and they have been much frequented and appreciated by the men.

"The means of out-door recreation have consisted of quoits, skittles, and at Barbados and Trinidad, where the men have ground available for it, cricket has been much played by the men with advantage to their health and amusement.

"There are no gymnasia in the Command, a want which I cannot but consider is much to be regretted, and more especially at Newcastle, Jamaica, a hill station where the men have little or no means of employing themselves in recreative exercise; from want of space cricket is there impracticable, and I am strongly of opinion that a gymnasium is an urgent need at Newcastle, and would conduce greatly to the maintenance of a high standard of health of the men, and to the better development of their physique.

"*Intemperance.*—While the sick returns show that the numbers of admissions into hospital directly caused by intemperance has been next to a minus quantity, it must be admitted that indirectly this habit has been a material factor in contributing much of the sickness which has prevailed; due, pro-

bably, partly to the increased thirst and greater languor incidental to a tropical *Foreign Stations*, climate and partly to the low price of rum, there is no doubt that a good deal of drinking prevails among the European soldiers in the West Indies, and the liquor which commends itself to them on account of its cheapness, the rum of the country, is an unsound unwholesome spirit which may not, as a rule, be indulged in without injury to health."

Surgeon-Major Gillespie, at Newcastle, strongly reports on this subject as follows:—"At no station at which I ever served have I seen such bad liquor as here, and no liquor I am persuaded is more injurious in its effects than the vile compound which is sold in the small shops in the neighbourhood and smuggled into the barracks under the name of rum."

"I regret to say that the soldiers largely avail themselves of this state of things, and thus render themselves more susceptible to the influence of disease."

"The following Sanitary Improvements have been made during the Year:—"

"Newcastle, Jamaica.—Prolonging surface drain further down the slopes on either side of cantonment.

"Clearing bush in the neighbourhood of cantonment.

"Planting Eucalyptus Globulus trees about cantonment generally.

"Barbados.—Brick Barracks.—New quarters for two staff sergeants, class A, provided.

"Married Quarters.—Water laid on in case of fire.

"Military Prison.—Water supply extended to prison yard in case of fire. Five rooms over entrance gate converted into quarters for two warders and their families.

"Royal Engineer Offices.—Two earth closets provided.

"Detached Quarters.—Disused barrier guard-house on Hastings Road converted into a staff sergeant's quarter.

"Late barrack sergeant's quarter on Savannah, additional room erected and converted into a staff sergeant's quarter.

"Water laid on in case of fire to "Myrtle Villa," "Queen's House," and "Retreat" and "Abingdon."

"Provost Cells.—Dry earth closet provided.

"Staff Sergeants' Barracks and Hospital Guard House.—Dry earth closet provided.

"Trinidad.—St. James' Barracks.—Open air skittle alley provided. Dry earth closet provided to commanding officer's quarters.

"A new concrete lined surface drain constructed leading from the staff sergeants into main surface drains."

West Africa.

Surgeon-Major T. W. Wright, the Senior Medical Officer, reports that:—"During the year the site chosen for a sanitarium on Leicester Mountain in 1877 was, by a board of officers pronounced not to be the best that could be got for the purpose. A new site was, therefore, selected which includes the whole of the peak of the mountain, and is between 800 and 900 feet higher than the last site. This is the best situation in a sanitary point of view that could be chosen. Three wooden huts have been erected as a tentative measure near this site, one large one to accommodate 22 men, a small sized one with cubic space for two men, and one for about six men.

"The peak of Leicester Mountain is, I consider, an excellent situation for a sanitarium, and have no doubt but that it would tend greatly to improve the health of both officers and men to have occasional change to that place; it is also close to where the principal supply of fruits, vegetables, fowls, ducks, &c. is to be had. I would suggest that the buildings be either of brick or stone, and as there are lots of the latter on the mountain, I think it would be cheaper in the end to build them of stones than to have wooden structures which would be always wanting repairs. The most suitable buildings for a sanitarium would, I think, be three small cottages for European officers, with a verandah round each, the building to be on pillars, and to have a servant's

Foreign Stations.

room, small kitchen, and a latrine close to each. One building for European non-commissioned officers with four rooms and verandah all around, and latrine close to it, and a hut to accommodate about 50 black troops.

"An addition has been made to the hospital at Sierra Leone, which was much needed; it has increased the accommodation by eight beds. A new prisoners' ward and dead house are much required, and the walls of the hospital enclosure ought to be increased so as to take in a triangular piece of ground (War Office property) adjoining it; this would increase the ventilation of the hospital, and enable a nice garden to be made which would add much to the sanitary condition of the building.

"A new bath has been made for the men; it is not well constructed, but as long as it lasts it will be a great boon to the troops, and is much used by them.

"A gymnasium would, I consider, be of great advantage to the troops."

Cape of Good Hope.

Deputy Surgeon-General James L. Holloway reports that:—"Owing to the demands made on the Royal Engineer Department during the year the sanitary improvements in this Command have been few. They are as follows:—

"*Cape Town.*—A latrine has been provided for A block, main barracks (married soldiers' quarters).

"*Fort Napier, Pietermaritzburg.*—The latrines of the infantry barracks have been improved. The hospital latrine has been enlarged. Ablution accommodation has been improved, as has also the water supply.

"*Clothing.*—The kersey frock issued to the Royal Artillery, Army Service Corps, and Army Hospital Corps is too thick and hot for the summer months in this climate. As it is lined with thick white flannel, I would recommend that the lining be removed, when it would be suitable for the summer and quite warm enough for the winter months.

"*Sanitary Defects and Recommendations.*—*Cape Town.*—The drains of the street on the south-west of the main barracks and the foreshore near the castle are reported to be in an insanitary state. Representations have been made regarding them. The drains in the main barracks are not at all in a good sanitary condition, nor are all the latrines and urinals. As there is a deficient supply of water for flushing the sewers, I have recommended that sea water be used for this purpose, as it is for road watering.

"The Contagious Diseases Act should be introduced. It is in force at Simon's Town, but not in Cape Town since 1867. The rate of admissions for venereal is very high. Special accommodation for infectious diseases should be provided. A better water supply be introduced. The lighting is bad. Kerosine lamps should be supplied instead of candles in barracks, reading rooms, &c. Ventilation in hospital guard room is bad.

"*Pietermaritzburg.*—Better accommodation for married families is required. Barracks for these families are in course of construction. Much of the hospital is old and dilapidated; this will shortly be replaced by new and convenient structures.

"*Newcastle.*—Latrine very primitive; no lavatory or bath room. This defect is to be remedied. A kitchen range is required, and this is to be supplied.

"*Pretoria.*—A new latrine is about to be built; a lavatory is proposed to be made."

St. Helena.

Surgeon-Major Franklin Gillespie, the senior medical officer, reports that:—

"The garrison stationed here during the year has been as usual very free from disorders of a serious nature, two deaths only having occurred from disease and two from violence, one of which was a suicide.

"There has been a good deal of minor illness, owing partly to the extremely *Foreign* wet weather, but chiefly to the numerous changes which occurred in the *Stations* garrison."

Mauritius.

Surgeon-Major H. Ferguson, the senior medical officer, reports that :—"The medical officer in charge of the sanitarium, Curepipe, states in his report that the want of a hospital at that station is much felt, and will be more urgently needed when the new barracks, which have already been commenced (January 1880), are completed. In this opinion I fully concur. There should be hospital accommodation for at least 10 patients. At present no men requiring hospital treatment can be sent there, and men falling seriously sick have to be re-transferred to either of the station hospitals at Port Louis or Mahébourg.

"I feel confident that the want of an hospital detracts very much from the benefits that would otherwise be derived from the sanitarium.

"The huts in course of erection are estimated for 60 men, so that when they are completed there will be accommodation for 92 men, or about a fourth of the Command; this of course will be a great benefit, but in my opinion the whole of the troops should be located in the high lands.

"In former reports I recommended the district of Moka, giving my reasons for preferring it to Curepipe, but as this does not seem feasible, I would strongly urge that barrack and hospital accommodation be provided at Curepipe for all the troops, leaving only, if necessary for military purposes, a small detachment at Port Louis, which should be relieved frequently. If this were carried out I have no doubt but that the health of the troops would be very greatly improved, and that the first outlay would soon be repaid by the saving effected by lessened sick list, mortality, and ratio of invaliding; but so long as the greater number of the troops reside on the malarious sea level I see little hope of any marked improvement taking place.

"Béri-béri, which at the commencement of the year broke out amongst the general population (principally the Indian), has nearly, if not quite, disappeared from all the districts of the Island.

"The cubic space in barracks and hospitals has been ample, as also the ventilation and means of ablution. Cooking accommodation satisfactory. There has been no change in the scale of the soldiers' rations, neither is any necessary. Clothing suitable to the climate.

"*Sanitary Improvements during the Year.* *Fort George.*—Deepening ditches and removing silt to glacis.

"*Curepipe (Sanitarium).*—New latrine for officers' quarters.

"*Port Louis (Station Hospital).*—The large cemented bath for the use of patients and hospital servants has been repaired and fitted with a shower bath."

Ceylon.

Brigade Surgeon T. Murphy remarks that :—"The health reports are generally favourable. I repeat the recommendation made last year that English potatoes be issued daily instead of being given as at present, only on three days a week.

"There have been no new buildings commenced. A cell has been added to the guard room at Trincomalee, and a cook house has been completed at Point-de-Galle.

"Near the barracks at Colombo is a canal, part of the defence of the old fort, which, I think, should be filled in. It is, however, outside military limits.

"There are no gymnasia in the Command. The medical officer at Kandy thinks that at that station a gymnasium is a desideratum. I concur in his opinion, but I do not think gymnasia desirable at the other stations of the Command."

*Foreign
Stations.**China and Straits Settlements.*

Deputy Surgeon-General W. A. Mackinnon, C.B., reports that :—"The following improvements and additions to the sanitary arrangements in the Command have been made :—

" *Hong Kong*.—Having the undergrowth of trees cut in and round the cantonment.

" *Murray Barracks*.—Extending sewer in connexion with latrines beyond low-water mark ; constructing fresh-water bathing pond at gymnasium.

" *Commissariat Buildings*.—Provide urinal.

" *Provost Prison*.—Convert cells in basement into stores.

" *Straits Settlements*.—The hospital at Penang is being re-roofed and thoroughly repaired ; a temporary hospital is in use meanwhile.

" The ventilation of the canteen at Fort Cornwallis has been improved by large holes being made in the arches forming the wall.

" Water pipes have been laid on to the Royal Artillery wash-house. The sea bath at Fort Cornwallis has been surrounded by a wooden wall."

INDIA.

*Bengal.**Bengal.*

The Sanitary Report for 1879 has not been received up to the time of going to press.

*Madras.**Madras.*

Surgeon-General Sir A. D. Home, V.C., K.C.B., reports :—

“There was more sickness amongst the troops in the Command than in the preceding year; an examination of the returns of sickness shows that the diseases from which the excess occurred were mainly those depending on meteorological conditions, causing results not within control by sanitary measures at present applicable. The deficient rainfall of the famine years has been followed at some stations, if not generally, by great rains, and in the present year paroxysmal fevers have been unusually common at those stations; in a strength not greatly different, the numbers of admissions for this class of fevers is upwards of a third greater than in 1878, those for continued fevers were a little less than a third greater. In the last-named group enteric fever caused a larger number of illnesses than in 1878, but the notices in the reports respecting this disease are so often incomplete and even contradictory, they do not lead to the assurance that the recorded instances were those alone in which enteric fever occurred.

“The reports afford no new facts in contribution to the controversy so long in progress respecting the originating cause of enteric fever in India, accumulated proof is given of the already thoroughly accepted fact, that youth and recent arrival and locality, combine the conditions which render a person most likely to be attacked with this disease. The reports specify that the latrine arrangements on the earth system were satisfactory; in very few instances is there any qualification of the statement; it is difficult to connect the causation of the disease with excremental impurity in barracks, but on the other hand it is very far indeed from being disproved. The probability of contagion being received outside the barracks is not adverted to in the reports. It may be assumed that the water used for drinking in barracks is with one doubtful exception uncontaminated, and the practice is general of having the cows which supply milk brought to the barracks to be milked in presence of some soldier deputed for the purpose. No facts are given such as might justify suspicion that the enteric fever contagion may be introduced into the body by any other means than those at present recognized, viz.:—air, water, and certain foods.

“Venereal diseases were exceedingly common and were so in spite of the enforcement of the Contagious Diseases Act at most of the important stations; the suggestions made in many of the reports that a wider extension and stricter enforcement of the Act would arrest the evil are in my judgment if adopted not likely to be useful.

“*Lighting.*—Many of the barracks have been lit with good Kerosine lamps during the year, in replacement of the former lamps burning vegetable oils, there is now a bright clear light instead of the former darkness made visible.

“*Cooking.*—The Medical Officer of the 12th Lancers at Secunderabad strongly objects to the dirty smoky houses in which cooking in the native fashion is carried on; a range is wanted for cooking. The Medical Officer, Royal Artillery, at Kamptee, also would prefer a cooking range to the present native mode of cooking.

“*Rations.*—The Medical Officer in charge, Royal Horse Artillery, Bangalore, thinks that the vegetables were scarce; the Medical Officer at St. Thomas Mount thinks that they were not sufficiently varied. In the battery of Royal Artillery at Tonghoo, four cases of scurvy were treated, a result of the want of suitable vegetables; it is believed that this can be obviated in future by the use of potatoes grown on the adjacent hill range.

Madras.

"Canteens.—The new regulations governing canteens were in force in them ; no restriction is placed on the amount of beer a soldier may be served with, except that he must pay for it at once, and he must be sober at the time. Most of the medical officers have seen no harm from this extension ; some think it has acted well ; others that it has increased drunkenness ; the medical officers of the depôts at Poonamallee and Wellington concur in condemning the new regulation as unsuitable for such places where the men have much time on their hands. The medical officers pretty generally condemn the issue (optional) of a dram of rum or of arrack ; they think it hurtful in initiating the habit of drinking in young soldiers.

"Clothing.—The clothing is generally considered very suitable and sufficiently varied. The Medical Officer, 12th Lancers, thinks, however, that a serge patrol jacket should be issued for use in the early morning of the rainy and of the cold season.

"At most stations in the rains charcoal is issued for fires to dry the damp clothes.

"Amusements.—No suggestion is made for increasing the means or for varying the kind of amusement. All the ordinary out of door and indoor amusements are available, apparently they are not much used by the majority of the men. At certain stations special recreations are permitted such as boating and shooting, and at many stations the men having no duty are allowed to leave barracks at any hour they please, instead of being restricted to certain hours. The sense of freedom in this respect is probably of the greatest advantage ; the medical officers generally remark that no harm has followed the permission for the men to go about in the heat of the day ; in one instance, however, a death from sunstroke was the consequence, but, though much to be regretted, the fact of this death having occurred should not be held as sufficient to condemn the practice.

"Hospitals.—The new hospital erected for the use of the depôt at Poonamallee was taken into use in the month of March ; it is reported to be in every respect exceedingly well adapted for the purpose. The site, however, is objected to, and a quarter for one of the subordinate medical establishment is required in connexion with it.

"A new hospital for the Royal Artillery at Secunderabad was occupied ; it is reported on favourably.

"At Rangoon it is proposed to construct a new hospital.

"At Kamptee, a lying-in ward is required for the women's hospital."

*Bombay.**Bombay.*

Surgeon General J. M. S. Fogo, the Principal Medical Officer, reports :—

"Barracks.—Colaba.—The defective site of the Infantry Barracks, being at the lowest level of a sloping soil, coupled with want of flooring of any description, is again strongly urged as a cause of the high rate of prevalence of miasmatic fevers amongst the troops occupying these barracks, compared with the Royal Artillery who have new barracks on raised plinth floored with stone.

"The local government, while admitting the urgent need for abandoning these barracks, and erecting new buildings on a better site already approved of, is unable in the face of recent orders to ask the Government of India for money to defray the cost of new barracks.

"Baroda.—With reference to the barracks at this station in the Annual Report for 1878, the Quartermaster General states that 'Plans and estimates for new barracks and subsidiary buildings are said to be in course of preparation, and when submitted will receive consideration.'

"Nasirabad.—The ventilation in the Artillery Barrack has been much improved.

"Taraghur.—Nob Barrack, an old boom-proof building, has a floor below the level of the verandah and adjacent ground, rendering the walls damp and mouldy, especially in the rains ; to remedy this it has been recommended to raise the floor 6 inches, besides adding to the height of the wall, and substituting a flat roof.

"*Mhow.*—The new barracks for the Royal Horse Artillery were occupied in *Bombay*. August, and afford all that can be desired.

"*Cells.—Baroda.*—In the estimates for new barracks, provision is made for new cells for both infantry and artillery.

"*Ventilation and Lighting.*—The ventilation of the barrack rooms has been generally satisfactory, and complaints regarding the lighting have ceased since kerosine lamps were introduced into all barracks during the year.

"*Flooring.*—Objectionable earthen floors still exist in the married quarters at *Kirkee*, *Ghizree Sanitarium* and *Infantry Barracks* at *Colaba*, and though Government is anxious to remove the evil the matter remains in abeyance until funds are available.

"*Latrines.*—The dry earth system of conservancy is in use everywhere.

"With reference to the difficulty frequently experienced in getting the men always to place dry earth in the pans previous to leaving the latrines, Government Resolution No. 3454 of 10th September 1879 states that 'the Sanitary Commissioner should ascertain if the application of some simple and inexpensive mechanical means to ensure the earth being used is practicable.'

"*Aden.*—The native latrine complained of in last year's report as being in a foul state, and too near the Royal Artillery Barracks at *Crater* has been replaced by a new building on better sanitary principles.

"*Mhow.*—The Deputy Surgeon-General reports that the rear walls of all the latrines have been lowered with a view of promoting perfusion of air.

"*Sanitary Condition of Vicinity of Barracks and Stations.—Colaba.*—The condition of the mangrove swamp referred to in previous years remains unaltered. On this subject the Quartermaster General states its reclamation is perhaps hopeless at present, in consequence of the vast expense; but the erection of good barracks in lieu of the very inferior buildings long since condemned, but still occupied by the troops, and a thorough system of drainage, would go far to mitigate the annual rate of sickness which is now deplorable.

"*Poona.*—The reputed unhealthiness of the *Ghorepur* lines has again been illustrated by the experience of the 2/11th Foot, which was moved there during the early part of 1879, from *Wanowrie*.

"During the ten months occupation of *Ghorepur* upwards of 2,000 cases of fever occurred, and the daily sick increased from 68 in 1878, to 93 in 1879.

"Deputy Surgeon-General Auchinleck assigns three causes for this:—

"1. The soil, which is disintegrating trap-rock, in a state of rapid decomposition.

"2. The situation of a large stream with swampy black mud immediately in rear of the lines.

"3. The lines being absolutely leeward of every building in *Poona*, when the wind is westerly or from the south, and when in the cold season the prevailing wind is easterly, the barracks are exposed to the malarious exhalations from the swampy ground.

"*Water Supply.*—The water supply has generally been good and abundant.

"My predecessor recommended that the *Macnamara* filters be fitted with wooden covers fastened on hinges and secured by padlocks in order to prevent dirty vessels being introduced. The Government of India, however, considered that as the practice referred to might reasonably be expected to be checked, it did not afford sufficient ground for incurring the additional expense. It was subsequently ruled that wooden covers with hinges be substituted for those of canvas as they become unserviceable.

"*Taraghur.*—With reference to the drinking water supplied to *Taraghur* alluded to in the annual report for 1878, the Commissioner at *Ajmere* states that it is the best water obtainable, and that a more convenient source cannot be found unless Government sanction the sinking of another well near the foot of the hill.

"*Hyderabad.*—The water supplied from the new waterworks was, during the early part of the year, found impure, owing to the low state of the *Indus*, the source of supply. As a temporary measure drinking water was obtained from wells, until means were adopted for getting rid of the stagnant water by a 'waste water conduit.'

Bombay.

“*Rations.*—A proposal by the Major-General Commanding Northern Division to issue a salt ration twice a week to troops at Teethul Sanitarium, in order to compensate for the want of fresh beef and the issue of indifferent mutton, received my support.

“For a little variety for the men the sanction of Government has been obtained for the modification of the vegetable ration by which 2 ounces of dhall to each man per diem twice a week is allowed, the ration of fresh vegetables being reduced on such days to the extent of the cost of dhall, which is very small.

“*Canteens.*—The Government of India has sanctioned revised canteen rules by which a soldier may obtain malt liquor in such quantities as his purse can buy from morning until tattoo; at the same time restricting the amount of rum to one dram daily to be issued only in half drams. This has been attended with a considerable reduction in the consumption of spirits.

“A new canteen at Mhow is contemplated, and an estimate has been sanctioned for one at the Wanowrie barracks, but funds are wanting.

“*Gymnastic Exercises.*—These have been generally most favourably reported on by medical officers of corps in which such training was conducted.

“*Hospital Accommodation.*—*Deolali.*—Here the want of increase of permanent hospital accommodation is much felt, as the present building provides only 30 beds, which are quite inadequate to the increased requirements since that estimate was made. Though satisfied of the insufficiency, I have refrained from addressing Government until the financial restrictions are withdrawn.

“*Purandhar.*—In order to provide for additional accommodation for invalids from the Poona Division, permission of the Commander-in-Chief was obtained to pitch tents at the Sanitarium at Purandhar.

“*Nasirabad.*—The Deputy Surgeon-General reports that since his last inspection a wall has been built to separate the hospital latrine from the bath room, the want of which was noted in my report for 1878.”

APPENDIX.

APPENDIX No. I.

REPORT ON THE PROGRESS OF HYGIENE FOR THE YEAR 1879 AND PART OF 1880.

By F. DE CHAUMONT, M.D., F.R.S., Surgeon-Major, Professor of Military Hygiene, Army Medical School, Netley.

I. Legislation.

THERE has been no legislation on the subject of public health this year, the political changes and the general election having left but little time for the consideration of the subject. Two Bills were brought in of some importance, neither of which became law, viz., the Bill for purchasing the works and rights of the London water companies, which failed mainly on account of the enormous price proposed to be paid. Some such measure, however, is likely to be carried out at a future time in the interests of the consumers. The other was the Bill to alter the existing vaccination laws so as to abolish repeated penalties for non-compliance with their provisions. That that Bill failed to become law can in no way be regretted, as it was calculated most seriously to defeat the efforts at prevention of disease which have hitherto been fairly successful, their partial failure being apparently due to the fact that the law has already been so often evaded. Penal legislation is of course undesirable if the object proposed can be effected otherwise, but the public health must in such cases be the first consideration. In contradistinction to the above proposal, I may mention a *projet de loi*, introduced into the French legislature by M. le Dr. Liouville, which proposes to render vaccination compulsory, not only in infancy, but at every subsequent decade up to 50 years of age. There is no question that such a law, could it be carried out, would effectually stamp out small-pox.

II. Work of Societies, &c.

1. The Sanitary Institute of Great Britain held its Congress this year (1880) in the City of Exeter, the proceedings following mainly the line adopted the previous year at Croydon, Earl Fortescue, whose name has been so intimately associated with sanitation for the last 40 years, presided and delivered the introductory address, in which he traced the rise and progress of sanitary inquiry and legislation in this country during the last half century. The sections were those of "Sanitary Science and Preventive Medicine," presided over by myself; "Sanitary Construction and Engineering," presided over by Mr. R. Rawlinson, C.E., C.B., &c.; and "Meteorology and Geology," presided over by Sir Antonio Brady, F.G.S., &c. The meetings were numerous attended and many papers of great interest were read. The place of meeting for next year has not yet been decided upon.

2. "Congrès International d'Hygiène et de Sauvetage." This Association held its biennial meeting at Turin in September 1880. No report of the proceedings has yet reached me.

3. At the same time and place the first general meeting of the "Association Internationale pour l'Eau Potable," took place. Resolutions were passed calling the attention of governments and official bodies generally to the great

importance of providing pure and plentiful supplies of water, as one of the prime necessities of life and health. Interesting information was furnished of the progress in this direction that had been made in different countries.

4. The annual meeting of the British Medical Association took place at Cambridge in August 1880. The section of Public Medicine was presided over by Dr. Acland, F.R.S., who delivered an able address.

The special questions discussed were :—

1. "The General Working of the Public Health Administration in Great Britain and Ireland."

2. "Diseases communicable to Man from Diseased Animals." On this question a valuable paper was contributed by Mr. G. Fleming, F.R.C.V.S., on the "Relation of Bovine Tuberculosis to the Public Health." This question, which is assuming an important aspect, is also treated very fully by Dr. C. Creighton in the "Journal of Anatomy and Physiology," Vol. XV., Part I., October 1880.

5. The German Sanitary Association held its meeting at Hamburg in September.

6. "Congrès International des Sciences Médicales." The biennial meeting of this Congress takes place in London in August 1881. The section of Public Medicine is to be presided over by Mr. Simon, C.B. Intimation of intention to read papers is to be sent in before the 31st March 1881. The following are the subjects proposed for papers and discussions.

First Day.—I. Measures by which to prevent the diffusion of different communicable diseases from country to country, or within the limits of any single country, *e.g.*—

1. Yellow fever, cholera, plague.
2. Enteric fever, scarlet fever, measles, whooping cough, diphtheria.
3. Syphilis.
4. Glanders, hydrophobia, anthrax.

Second Day.—II. Influence of various articles of food (not including water) in spreading parasitic, zymotic, tubercular, and other diseases.

Third Day.—III. Conditions to be imposed on the legally qualified practitioners of one country who may seek authority to practice in another country.

IV. Precautions to be taken in medical nomenclature and classification to guard against false statistical conclusions.

III. Literature.

1. "Hygiene and Public Health," edited by A. Buck, M.D., London and New York.

The two ponderous volumes which form this work make it perhaps the largest, if not the fullest, of modern treatises on hygiene. It was undertaken as an introduction to the American edition of Ziemssen's great work on medicine, and it consists more of a series of monographs than a treatise on an uniform plan. Each division has been undertaken by different writers, some of whom, like the well known Dr. J. S. Billings, are recognized both here and in America as representative men in sanitary science. It is of course inseparable from a book compiled in such a way that there should be some inconsistencies, and there are also not a few inaccuracies in many places, as well as numerous important omissions. At the same time the mass of information collected together is very valuable. The bibliography is very full at the end of each section, but here too are serious inequalities; some important works being omitted altogether, whilst short and even ephemeral pamphlets and papers are recorded as works of authority. It is perhaps a little ungracious to complain of such a list being too full, but it is certainly desirable that really important writings should be recorded first, whilst the smaller and less valuable might find a place only if there were room afterwards. We must, however, accord to the American writers the praise that their efforts to secure full bibliographical lists have been much more active than those of most, if not all writers in our own country, and it is particularly desirable in sanitary science that the records should be as full as possible. A

complete bibliographical catalogue of sanitary works and papers would be a great boon to all workers on the subject. Dr. Buck's voluminous work will no doubt take its place as the standard work of reference in America, and it will also be largely used both in this and in other countries. Probably in a future edition the opportunity will be taken to remove the blemishes to which I have referred.

Jahresbericht über die Leistungen und Fortschritte auf dem Gebiete des Militair Sanitäts-Wesens. Von Dr. W. Roth, General-Arzt, 1 cl. Dresden.

This is the annual report compiled by Dr. Roth with the assistance of a zealous staff of co-workers. It is, like its predecessors, very full of valuable matter on all parts of military medicine and surgery, as well as sanitary matters. A bibliographical list is attached to each section.

"Transactions of the Sanitary Institute of Great Britain. Croydon Congress, 1879." Edited by H. C. Burdett and F. de Chaumont, M.D., F.R.S.

This contains the addresses, the papers, and some of the discussions of the meeting of 1879, and forms the first volume of the Institute's transactions. Many of the papers are of great interest.

The Transactions of the Exeter Congress, 1880, will probably appear before the close of the year.

"Handbook of Hygiene," by George Wilson, M.A., M.D., 4th edition, Churchill.

A new edition of this useful manual has made its appearance. There are a good many improvements and much additional information.

"Elements of Indian Hygiene," by John C. Lucas, F.R.C.S. Eng., &c., Her Majesty's Indian Medical Service. London, J. & H. Churchill, 1880.

This volume has the merit of brevity, but in all else it is disappointing. Its vagueness and want of detail render it of comparatively little use to those who are new to the subject, whilst to those who are already acquainted with sanitary matters it is a mere collection of truisms. A good work of the sort is a desideratum, which has certainly not been supplied by the present one.

It may here be noted that the Indian Government has offered a prize of Rs. 1,000 for the best short handbook of hygiene for British soldiers in India, to be about 70 or 80 pages, small pica, octavo size. The competition which is to be by motto, is to take place on the 31st of March 1881.

"Index Catalogue of the Library of the Surgeon-General's Office, U.S. America," Vol. I., A.—BERLINSKI, Washington, Government Printing Office, 1880.

This splendid volume of 888 pages is the first instalment of a great undertaking, carried out by Dr. J. S. Billings and his able fellow-workers. The plan of the work was referred to, in noticing the specimen fasciculus, in my Report on Hygiene, Vol. XVIII., of the Army Medical Reports. The first volume fully bears out the expectations that were raised, and the liberality with which it has been distributed merits general gratitude and recognition. The work is estimated to cost \$250,000 (50,000*l.*), and when completed it will be the most extensive bibliographical record of medical works in existence.

IV. *Special Points of Hygiene.*

1. *Water.*—A table of analyses of samples sent to the laboratory at Netley is appended, drawn up by Surgeon-Major J. L. Notter, M.D. The plan followed is much the same as that of last year's report. I have not found it possible, as yet, to obtain any definite indications by the microscope that would render a tabulated statement of much use. It is hoped, however, that by accumulating facts some conclusions may be ultimately arrived at.

TABLE OF WATER ANALYSES

No.	Station.	Source.	Physical Characters.	Microscopic Characters.	Qualitative Tests.			
					Oxidizable Matter indicated by Gold Chloride.	Nitric Acid.	Iron.	Sulphuric Acid.
ENGLAND.								
1	Aldershot, C. Lines.	Well, Assistant-Adjutant General's Quarters.	Slightly yellow, not turbid, small sediment, good lustre and taste, no smell.	Mineral grit, old linen fibre, decaying vegetable matter, insect scales, Acari, mycelium and spores of Fungi.	Large	Large	Trace	None
2	Aldershot, E. Lines.	Assistant - Quartermaster-General's Quarters.	Slightly yellow, not turbid, flat taste, fair lustre, no smell.	Dead leaves, overgrown with Fungi, small ciliated animalcules, with turbellaria.	Large	Large	Trace	None
3	Aldershot	Well; Assistant-Adjutant-General's Quarters, depth, 44'.	Slightly yellow, no turbidity, small sediment, fair lustre and taste, no smell.	Mineral grit and a little minute Fungi.	Large	Very large.	Trace	Present.
4	Aldershot	Assistant - Adjutant - General's Quarters.	Slightly yellow, small sediment, fair lustre, good taste, no smell.	Ferruginous matter, mycelium and spores of Fungi.	Large	Large	None	Trace
5	Aldershot	No. 1 Well, Pirbright Rifle Ranges.	Slightly yellow, slight turbidity, very small amount of sediment.	Mineral grit and amorphous matter, Stylonychia, Coccidina, Anguillula, Amæbæ.	Large	Large	None	Trace
6	Aldershot	No. 2 Well, Pirbright.	Slightly yellow and turbid, no sediment, good lustre and taste.	Mineral grit, deal chips, monads very small, fungoid spores.	Large	Large	None	Trace
7	Aldershot	No. 3 Well, Pirbright.	Yellowish, turbid, large sediment, dull taste flat, no smell.	Mineral grit, pine fibre, fungoid spores, minute Amæbæ.	Large	Very large.	None	Present.
8	Aldershot	Bowley Reservoir	Yellowish, slightly turbid, large sediment, dull lustre, flat taste, no smell.	Mineral grit, minute Amæbæ, amorphous matter, spores of Fungi, paramacium, Oxytricha gibba.	Large	Large	None	None
9	Aldershot	No. 1 Well, Pirbright.	Yellowish, turbid, large sediment, fair lustre, flat taste, no smell.	Ferruginous matter, in very large quantities, mineral grit, and a few minute Amæbæ.	Large	Very large.	Trace	None
10	Aldershot	No. 2 Well	Same	Ferruginous matter. Minute Amæbæ.	Large	Very large.	Trace	None
11	Aldershot	No. 3 Well	Same	Same	Large	Very large.	Trace	None
12	Aldershot	Well, Assistant-Adjutant-General's Quarters.	Slightly yellow, not turbid, small sediment, good lustre and taste, no smell.	Fungus spores, grit, and amorphous matter, vegetable tissue, no trace of animal or vegetable life.	Trace	Very large.	Trace	None
13	Brighton	Well, 30' deep	Whitish, not turbid, small sediment, sparkling, good taste.	Mineral grit and a few crystals of carbonate of lime.	Present	Very large.	None	Large
14	Brighton	Town well, 36 deep.	Yellowish, not turbid, small sediment, fair lustre and taste.	Mineral grit and amorphous matter, exuvæ of insects, crystals of carbonate of lime.	Present	Very large.	None	Large

TABLE OF WATER ANALYSES.

Hardness. Degrees of Clark's Scale.		Chlorine, Grains per Gallon.	Ammonia, Parts per Million.		Solids, Grains per Gallon.		Oxygen required (de- termined by Permanganate of Potassium, Heat, and Sulphuric Acid), Parts per Million.		Nitrous Acid, Parts per Million.	Remarks.	No.
Total.	Fixed.		Free.	Albu- minoid.	Total.	Fixed.	For Total Oxidizable Matter.	For Organic Matter only.			
15.05	4.53	4.2160	None	0.1632	23.85	22.75	0.5000	0.5000	None	Impure, should be carefully filtered be- fore use.	1
6.65	2.10	1.2400	None	0.2300	10.15	5.60	0.5400	0.4600	0.2300	Same as previous sam- ple.	2
16.10	9.80	6.2992	0.0268	0.0960	29.05	25.54	0.4200	0.4200	None	Evidently soakage from cesspit. NO_3 =81.1219 mill. per litre. Water clear- ing itself, but still impure.	3
8.05	3.85	1.4384	0.1536	0.1464	16.10	15.40	0.8200	0.3800	1.2650	Unfit for use - -	4
8.05	5.25	1.6552	0.1200	0.1100	19.95	18.55	1.0600	1.0200	0.1150	Unfit for use - -	5
8.05	5.25	1.0416	0.0528	0.0810	15.40	14.70	0.8200	0.7000	0.3450	An unsafe water, though usable now.	6
8.05	5.25	1.3392	0.8960	0.1440	18.53	17.85	1.7600	1.3600	1.1500	Unfit for use - -	7
1.57	0.70	0.7440	None	0.1464	7.23	6.43	1.4200	1.1800	0.6900	A peat water, usable; organic matter chief- ly vegetable.	8
5.77	4.72	1.2425	None	0.1512	8.75	7.75	1.1800	1.0200	0.4600	Unfit for use - -	9
4.55	3.15	1.2425	0.1240	0.0984	10.18	9.45	0.4200	0.3800	0.1150	Not so good as last analysis; an unsafe water.	10
6.12	4.20	1.2425	None	0.0992	12.98	12.14	2.1000	1.6600	1.2600	Much improved since last report; an un- safe water.	11
4.55	3.50	1.5407	0.0780	0.0560	14.87	11.56	0.3400	0.1800	0.4600	Improved since last report. Fit for use, but advisable to have it again exam- ined in a few weeks.	12
33.25	19.25	30.9134	0.0496	0.2080	96.74	92.05	0.4600	0.4200	0.1150	Unfit for use - -	13
14.00	7.00	7.3059	0.0472	0.2440	43.29	42.00	1.8600	1.7000	0.7475	Unfit for use - -	14

No.	Station.	Source.	Physical Characters.	Microscopic Characters.	Qualitative Tests.			
					Oxidizable Matter indicated by Gold Chloride.	Nitric Acid.	Iron.	Sulphuric Acid.
15	Dover	- Commanding Royal Engineer's House, tank.	Slightly yellow, small sediment, fair lustre, but flat taste, no smell.	Decaying vegetable matter and Fungi, mineral grit, and soot.	Large	Large	None	Trace
16	Dover	- Commanding Royal Engineer's House, well.	Bluish white, sparkling and clear, good taste, no smell.	Crystals of carbonate of lime -	Trace	Large	None	Trace
17	Dover	- Commanding Royal Engineer's House, scullery.	Same as previous sample.	Crystals of carbonate of lime -	Trace	Large	None	Trace
18	Fareham	- Top of well	Very yellow, not turbid, flat taste, small sediment, no smell.	Mineral grit, vegetable cells, decaying tissue, cotton and linen fibre, Amæbæ, spores and mycelium of Fungi, Stylo-nychia.	Large	Very large.	None	Trace
19	Fareham	- Bottom of well	Yellow, not turbid, small sediment, fair lustre and taste, no smell.	Amorphous matter, brown vegetable débris, mycelium of Fungi in an unwholesome state, Monadina, Trinema Acinus, Actinophrys.	Large	Very large.	None	Trace
20	Gosport	- Hospital well	Whitish, not turbid, small sediment, good lustre and taste, no smell.	Vegetable débris, Leptothrix Ochrea, spores of Fungi,	Trace	Present	None	Trace
21	Gosport	- Waterworks Company.	Slightly blue, not turbid, clear and sparkling.	Mineral grit and a little amorphous matter.	Trace	Present	None	Trace
22	Gosport	- Port Brockhurst, well.	Whitish, not turbid, clear and sparkling, good taste and smell.	Ferruginous matter with a little mycelium running through it.	Trace	Present	Trace	None
23	Gosport	- Port Monckton	Yellowish, not turbid, some sediment, good lustre, no smell.	Mineral grit and brown vegetable matter in a state of decay, mycelium of Fungi, fine and twisted.	Present	Very large.	None	None
24	Guernsey	- Officers' mess, R.A.	Slightly yellow, clear and sparkling, flat taste, no smell.	Decaying vegetable tissue, fine linen and cotton fibre, dyed wool, hair, epidermis of grass.	Present	Large	None	None
25	Guernsey	- Officers' Quarters	Same - - -	Amorphous matter, and a few mineral particles.	Trace	Present	None	None
26	Isle of Wight	Golden Hill Fort, well.	Yellowish, not turbid, some sediment, fair lustre, flat taste, no smell.	Vegetable débris undergoing change, Protococcus cells, grains of pollen, living Cyclops.	Trace	Present	None	Trace
27	Isle of Wight	Deep well, Golden Hill Fort.	Clear, not turbid, very small sediment, good lustre and taste, no smell.	Mineral grit and epidermis of grass, vegetable débris.	Present	Large	None	Trace
28	Lydd, Kent	Artesian well in Camp, No. 1.	Whitish, slightly turbid, some sediment, fair lustre, flat taste.	Mineral grit and amorphous matter.	Trace	Large	None	None

Hardness. — Degrees of Clark's Scale.		Chlorine, Grains per Gallon.	Ammonia, Parts per Million.		Solids, Grains per Gallon.		Oxygen required (de- termined by Permanganate of Potassium, Heat, and Sulphuric Acid), Parts per Million.		Nitrous Acid, Parts per Million.	Remarks.	No.
Total.	Fixed.		Free.	Albu- minoid.	Total.	Fixed.	For Total Oxidizable Matter.	For Organic Matter only.			
9° 80	4° 55	7° 2912	0° 0520	0° 1120	23° 45	22° 75	1° 0300	1° 0600	None	Impure for rain water. The tank should be seen to.	15
16° 80	4° 55	2° 4304	None	None	25° 80	25° 20	0° 0800	0° 0600	0° 0570	Fit for use - -	16
16° 80	4° 55	2° 4304	None	None	28° 40	28° 70	0° 0600	0° 0600	0° 0570	Fit for use - -	17
11° 55	5° 25	1° 3392	0° 0292	0° 4696	23° 80	22° 40	2° 1800	1° 0800	1° 4375	Unfit for use - -	18
15° 05	7° 70	6° 9030	0° 0252	0° 3696	56° 35	54° 95	2° 1800	1° 6800	1° 4375	Unfit for use. The chlorine and solids are very much greater than in previous sample. It is possible that the access of sea water may partially account for this. This water is also contaminated with sewage.	19
11° 55	7° 00	5° 9024	None	None	28° 70	28° 35	0° 9800	0° 5800	1° 1500	Fit for use - -	20
11° 55	7° 00	5° 9024	None	None	30° 45	29° 75	0° 9800	0° 5000	1° 3800	Fit for use - -	21
5° 25	0° 525	1° 5407	None	None	21° 42	18° 65	0° 1800	0° 1800	None	Fit for use - -	22
4° 025	0° 350	2° 9323	0° 3520	0° 0512	22° 38	22° 01	1° 1800	0° 6000	2° 0550	Unfit for use, without careful filtration. Possibly the well requires cleaning. Surface drainage near the well should be seen to.	23
2° 80	1° 75	2° 2320	0° 6088	0° 0080	9° 45	8° 75	0° 4200	0° 3400	0° 2300	Unfit for use without careful filtration.	24
2° 80	1° 75	1° 3392	None	0° 0226	5° 95	5° 60	0° 1800	0° 1400	0° 1150	Fit for use - -	25
20° 30	9° 45	9° 2752	None	0° 1680	65° 80	64° 05	1° 4200	1° 4200	None	Unfit - -	26
37° 62	9° 80	8° 4816	0° 1120	0° 0844	47° 95	47° 25	0° 5400	0° 5400	None	Improved since last analysis.	27
5° 60	0° 70	1° 4384	None	0° 1072	15° 40	14° 70	0° 9000	0° 4600	1° 2650	Usable, but not satisfactory.	28

No.	Station.	Source.	Physical Characters.	Microscopic Characters.	Qualitative Tests.			
					Oxidizable Matter indicated by Gold Chloride.	Nitric Acid.	Iron.	Sulphuric Acid.
29	Lydd, Kent	Artesian No. 2. well,	Dirty white, large sediment, unpleasant taste, no smell.	Débris of organic matter, round sporangial bodies, a few flagellate animalcules.	Large	Very large.	None	Trace
30	Netley Farm	Well - -	Whitish, slightly turbid, no smell, small sediment.	Mineral grit, epidermis of grass, cotton and linen fibre.	Trace	Very large.	None	Trace
31	Netley	- Well - -	Clear, no sediment, fair lustre and taste, no smell.	Very little amorphous matter	Large	Very large.	None	Trace
32	Netley	- Hospital supply tank.	Yellowish, some sediment, slightly turbid, fair taste, no smell.	Ferruginous matter in large quantities, old linen and cotton fibres, soot, amorphous matter.	Present	Large	Trace	None
33	Sandown	- Iron tank, supplied by Waterworks Company,	Yellowish, very slightly turbid, very large sediment, good lustre and taste, no smell.	Amorphous matter, very slender Synedra, decaying vegetable matter, Halteria, Aspidisca, Oxytricha, Dileptus, Paramecium, Anguillula, Stylonychia.	Large	Very large.	None	Trace
34	Sandown Fort.	Sandown Water Company.	Slightly yellow, clear and sparkling, fair taste, no smell.	Spores, Synedra, Anguillula, Amœbæ, Aspidisca, Oxytricha, Pediastra, Stylonychia.	Large	Very large.	Trace	None
35	Sheerness	- Well - -	Very yellow, turbid, large sediment, flat taste.	Decaying vegetable matter, small Amœbæ, exuviae of insects.	Very large.	Very large.	None	Large
36	Sheerness	- Well, Half Way House.	Yellow, turbid, some sediment, fair lustre, flat taste, no smell.	Dyed wool, hair, fine fibre, Fungi, Monads, solitary Vorticellæ in large numbers.	Large	Very large.	None	Trace
37	Sheerness	- Well - -	Very yellow, no turbidity, some sediment, fair lustre and taste, no smell.	Mineral grit, mycelium and spores of Fungi, Oxytricha Gibba, old linen and cotton fibres.	Large	Very large.	None	Large
38	Sheffield	- Well and springs	Whitish, not turbid, very small sediment, very good lustre and taste, no smell.	Mineral grit, woody fibre, coffee grounds, dyed wool, Diffugia, Oxytricha, Acarus, colourless Oscillatorians, Monadina and mycelium of Fungi.	Trace	Large	None	Present.
39	Southwold	- Well - -	Faintly yellow, not turbid, clear and sparkling, flat taste, no smell.	Mineral grit, mycelium and spores of Fungi.	Large	Very large.	None	Present.
40	Towthorpe, Yorkshire.	Artesian Well, 210' deep.	Slightly yellow, not turbid, large sediment, good lustre, and taste.	Mineral grit - - -	Trace	Large	None	Large
SCOTLAND.								
41	Fort George	Well at Station Hospital.	Clear, sparkling, good, taste, no smell.	Mineral grit - - -	Trace	Present	None	Trace
42	Fort George	Same - -	Slightly yellow, clear and sparkling, good taste.	Minute mineral matter, mycelium and spores of Fungi.	Trace	Present	None	Trace

Hardness. — Degrees of Clark's Scale.		Chlorine, Grains per Gallon.	Ammonia, Parts per Million.		Solids, Grains per Gallon.		Oxygen required (de- termined by Permanganate of Potassium, Heat, and Sulphuric Acid), Parts per Million.		Nitrous Acid, Parts per Million.	Remarks.	No.
Total.	Fixed.		Free.	Albu- minoid.	Total.	Fixed.	For Total Oxidizable Matter.	For Organic Matter only.			
15°05	4°55	16°2192	0°7104	0°2960	67°55	65°45	4°4600	2°7400	5°4625	Unfit for use - -	29
11°10	10°10	3°2500	None	0°0600	Not determined		0°3400	0°3400	None	Usable - -	30
Not determined		3°5712	None	0°0720	Not determined		0°4200	0°2600	0°3450	Unsafe from situation of well and large amount of nitric and nitrous acids.	31
Not determined		2°0832	None	0°0792	Not determined		0°4200	0°3800	0°1150	Tank requires clean- ing.	32
8°05	3°15	2°4304	0°1500	0°5440	17°15	15°75	1°6200	1°6200	None	Unfit for use - -	33
8°75	2°30	2°6341	0°1340	0°2080	18°97	18°06	1°5000	1°1400	0°4600	Impure - -	34
90°75	84°00	60°6112	0°7168	0°8352	271°95	254°10	4°6800	3°1200	4°4275	Unfit for use - -	35
22°75	8°75	3°8192	0°0684	0°0600	48°30	47°25	0°6200	0°5000	0°3460	Usable. Filtration ad- visable.	36
75°25	57°75	48°3600	0°1464	0°5472	206°85	205°45	3°0800	2°8200	0°6900	Unfit for use - -	37
13°25	3°85	2°2320	0°0406	0°0720	23°10	22°55	0°1800	0°1800	None	Well dirty, as shown by microscopic ana- lysis. No marked impurity by chemi- cal analysis.	38
20°30	13°30	8°0843	0°0564	0°1656	64°05	63°85	0°5800	0°3800	0°5750	Unfit for use - -	39
87°50	57°75	1°6368	0°4548	0°0660	135°80	134°05	0°6600	0°5900	0°2300	Improved, but still too hard for a good water supply.	40
16°80	10°50	5°8032	None	None	47°60	46°70	0°2290	0°2200	None	Fit for use - -	41
16°80	11°55	5°9552	0°0360	None	42°35	41°85	0°3400	0°2000	0°2300	Fit for use - -	42

No.	Station.	Source.	Physical Characters.	Microscopic Characters.	Qualitative Tests.			
					Oxidizable Matter Indicated by Gold Chloride.	Nitric Acid.	Iron.	Sulphuric Acid.
IRELAND.								
43	Ballincollig	Centre well, 23' deep.	Whitish, clear and sparkling, very little sediment, good taste.	Mineral grit and crystals of carbonate of lime.	None	Present	None	Present.
44	Ballincollig	West well, 23' 9" deep.	Very yellow, clear and sparkling, no sediment.	Amorphous matter, cotton and linen fibre, vegetable débris.	Present	Very large.	Present	Trace
45	Ballincollig	East well, 14' deep	Slightly yellow, not turbid, sparkling, no smell.	Old linen and cotton fibre, spores in large quantity, vegetable débris.	Large	Very large.	Trace	Trace
46	Belfast	Basin, 1½ miles from Barracks.	Yellow, not turbid, some sediment, lustre good, taste flat, no smell.	Mineral grit and amorphous matter, Anthophysa tubes, Monads and minute Amæbæ.	Present	Large	None	None
47	Belfast	Lowry's Lough	Slightly yellow, not turbid, a little sediment, good lustre and taste, no smell.	Mineral grit, Anthophysa tubes, Uvella, minute diatoms, Monads, and Amæbæ.	Present	Large	None	None
48	Beltrubet	Underground tank.	Yellow, not turbid, small sediment, flat taste, no smell.	Hair, wool, cotton, spider's web, crystals of uric acid, dead Acari, Oxytricha Lingua, Bacteria, and numerous diatoms, all dead.	Large	Very large.	None	Trace
49	Cahir	Mountain stream	Faintly yellow, not turbid, some sediment, very good lustre, fair taste, no smell.	Mineral grit and epidermis of grass, worn wool, old linen, epithelium, minute Amæbæ, Monads.	Trace	Present	None	None
50	Fermoy	No. 1 Well (new)	Bluish white, not turbid, small sediment, good taste, no smell.	Mineral grit, and crystals of carbonate of lime.	None	Present	Trace	Trace
51	Fermoy	No. 2 Well (new)	Slightly yellow, clear, small sediment, fair taste, no smell.	Mineral grit, and crystals of carbonate of lime, vegetable cells, Septoria, and Chlorococcus cells.	Trace	Large	None	Trace
52	Fermoy	No. 2 Well	Whitish, not turbid, very little sediment, very good lustre and taste.	Crystals of carbonate of lime and mineral grit.	None	Present	None	Trace
53	Fermoy	No. 3 Well, Old Barracks, top of well.	Whitish, not turbid, small sediment, very good lustre and taste.	Brown granular matter, amorphous matter in broken flocculi, free Monads, and minute ciliated infusoria, Septoria and Fungi.	None	Present	None	Trace
54	Fermoy	No. 3 Well, Old Barracks, bottom of well.	Whitish, not turbid, small sediment, fair lustre, good taste, no smell.	Large mineral particles, Fungal filaments, Septoria, minute Algae, filamentous and unicellular.	None	Present	None	Trace
55	Fermoy	Well, Station Hospital.	Whitish, not turbid, small sediment, fair lustre, good taste, no smell.	Mineral grit, minute amorphous matter, Septoria, Chlorococcus cells.	Trace	Present	None	Present.
56	Fermoy	Well	Whitish, very slightly turbid, small sediment, good taste.	Fungal filaments, Septoria, minute Algae, unicellular.	Trace	Present	None	Present.
57	Fermoy	No. 2, Well, Old Barracks,	Same as previous	A little amorphous matter, no trace of animal or vegetable life.	Trace	Present	None	Present.

Hardness. — Degrees of Clark's Scale.		Chlorine, Grains per Gallon.	Ammonia, Parts per Million.		Solids, Grains per Gallon.		Oxygen required (de- termined by Permanganate of Potassium, Heat, and Sulphuric Acid), Parts per Million.		Nitrous Acid, Parts per Million.	Remarks.	No.
Total.	Fixed.		Free.	Albu- minoid.	Total.	Fixed.	For Total Oxidizable Matter.	For Organic Matter only.			
15°35	3°15	1°5407	None	None	23°94	23°62	0°1800	0°1000	0°1150	Fit for use - -	43
5°25	3°33	1°3419	0°5760	0°1232	8°50	8°05	0°4600	0°3800	0°2300	Unfit for use - -	44
16°03	4°02	1°7395	0°2112	0°1696	27°40	25°48	0°7800	0°5800	0°5750	Unfit - -	45
9°05	1°40	0°8432	None	0°2240	15°40	14°35	2°1200	1°5800	1°8400	There is an excess of or- ganic matter, chiefly vegetable. Filtration advisable before use.	46
9°10	2°10	0°9424	0°0369	0°1720	13°30	12°25	2°1400	1°600	1°5525	The same remarks ap- ply here as noted in previous sample.	47
11°55	2°80	1°8352	None	0°1536	25°90	23°80	1°1000	0°8200	0°8050	Unfit. Roofs of col- lecting building should be cleaned; possibly bird drop- pings contaminate the supply.	48
3°15	2°45	0°9424	None	None	7°350	7°00	0°3800	0°3800	None	Fit for use - -	49
18°00	4°20	1°4384	None	None	26°25	22°40	0°1800	0°1800	None	Fit for use - -	50
16°50	4°20	1°4384	None	0°1776	28°70	26°25	0°3800	0°3800	None	Requires filtration be- fore use.	51
16°50	3°85	1°4384	None	None	25°20	24°85	0°1800	0°1800	None	Fit for use - -	52
22°05	5°95	3°0256	None	None	48°65	47°95	0°1800	0°1000	0°2300	Fit for use - -	53
25°05	5°95	3°0256	None	0°0504	49°70	48°30	0°1800	0°1000	0°2300	Fit for use - -	54
21°05	6°30	3°4124	None	None	54°25	53°50	0°1800	0°1800	None	Very hard, but organi- cally pure, and fit for use.	55
22°05	8°05	3°4124	0°0640	None	44°80	44°10	0°1800	0°1400	0°1150	Very hard, but organi- cally pure, and fit use.	56
23°45	7°35	2°7280	None	None	44°45	43°75	0°1000	0°1000	None	Same remarks - -	57

No.	Station.	Source.	Physical Characters.	Microscopic Characters.	Qualitative Tests.			
					Oxidizable Matter indicated by Gold Chloride.	Nitric Acid.	Iron.	Sulphuric Acid.
58	Fermoy	No. 4 Well, New Barracks.	Whitish, not turbid, very pleasant taste, clear and sparkling.	A few crystals of carbonate of lime.	None	Present	None	Trace
59	Fermoy	No. 3 Well, New Barracks.	Bluish white, very clear and sparkling, good taste, no smell.	A few crystals of carbonate of lime.	None	Present	None	Trace
60	Fermoy	No. 5 Well, New Barracks.	Whitish, not turbid, some sediment, sparkling and good taste.	Amorphous matter, vegetable debris, mycelium and spores of Fungi, mineral grit.	Trace	Large	None	Present.
61	Fethard	Pump, near Barracks.	Whitish not turbid, very small sediment, good lustre and taste.	Mineral grit and crystals of carbonate of lime.	Trace	Present	None	Trace
62	Fethard	Well in Barracks	Same - - -	Same - - -	Large	Very large.	None	Trace
63	Fethard	Well (not marked)	Same - - -	Same - - -	Trace	Present.	None	None
64	Greencastle Fort.	No. 1 Well, Lower Battery, depth 21	Yellowish, slightly turbid, small sediment, fair lustre and taste, no smell.	Mineral grit, and amorphous matter, mycelium and spores of Fungi, decaying vegetable tissue.	Large	Large	None	Trace
65	Greencastle Fort.	Well sunk in rock.	Faintly yellow, not turbid, sparkling, good taste, no smell.	Mineral grit, epidermis of grass, cotton and linen fibre, Amæbæ, Oxytricha, Paramecium.	Trace	Present	None	Trace
66	Newry	Well in hired married quarters.	Slightly yellow, not turbid, small sediment, good lustre and taste.	Mineral grit and brown granular matter.	Large	Very large.	None	Present.
67	Tralee	Town water-works.	Faintly yellow, not turbid, clear and sparkling, good taste, no smell.	Mineral grit and amorphous matter.	Trace	Present	None	None
ABROAD.								
68	Cyprus	Gourronia Spring.	Whitish, not turbid, clear and sparkling.	Numbers of minute diatoms, very active, Actinophrys, Oxytricha, Amæbæ.	Trace	Present	None	Trace
69	Cyprus	Limasol Aqueduct.	Whitish, slightly turbid, some sediment, fair lustre and taste.	Minute diatoms, Diffugia, Arcella, filamentous Algae, Anguillula, crystals of calcium carbonate.	Trace	Present	None	Trace
70	Cyprus	Limasol, well at dépôt.	Slightly yellow, not turbid, clear and sparkling, good taste.	Mineral grit and ferruginous matter Rotifer Vulgaris, Oxytricha Gibba, Dileptus.	Present	Large	None	Trace
71	Gibraltar	Southport	Bluish white, clear and sparkling, hard taste, no smell.	Mineral grit and amorphous matter.	Present	Very large.	None	Present.
72	Gibraltar	Ragged Staff	Bluish white, not turbid, small sediment, good taste.	A little mineral grit - -	Present	Very large.	None	Present.
73	Gibraltar	Sanitary Commissioners' Well, No. 2.	Whitish, not turbid, clear and sparkling.	Amorphous matter, spores of Fungi, cotton fibre.	Large	Very large.	None	Present.
74	Gibraltar	Sanitary Commissioners' Well, No. 3.	Same - - -	Same - - -	Large	Very large.	None	Present.
75	Gibraltar	Sanitary Commissioners' Well.	Whitish, not turbid, clear and sparkling.	Mineral grit and amorphous matter, mycelium of Fungi.	Large	Very large.	None	Present.

Hardness. — Degrees of Clark's Scale.		Chlorine, Grains per Gallon.	Ammonia, Parts per Million.		Solids, Grains per Gallon.		Oxygen required (de- termined by Permanganate of Potassium, Heat, and Sulphuric Acid), Parts per Million.		Nitrous Acid, Parts per Million.	Remarks.	No.
Total.	Fixed.		Free.	Albu- minoid.	Total.	Fixed.	For Total Oxidizable Matter.	For Organic Matter only.			
23°05	11°20	1'0416	None	None	36°40	35°70	0'1800	0'1000	0'2300	Very hard, but organi- cally pure and fit for use.	58
20°30	13°30	1'0416	None	0'0224	31°50	30°80	0'1800	0'0600	0'3450	Fit for use - -	59
22°05	6°30	1'0416	None	0'0560	32°20	31°50	0'4600	0'1800	0'8050	Fit for use - -	60
25°00	2°80	1'8814	0'0496	0'0852	30°10	29°05	0'2200	0'1800	0'1150	Fit for use - -	61
29°75	2°80	1'6368	0'2560	0'3280	34°65	33°95	0'5800	0'5400	0'1150	Unfit for use - -	62
29°75	2°80	1'6368	0'0496	0'0400	33°60	32°55	0'5800	0'5400	0'1150	Fit for use - -	63
14°80	5°60	2'9264	0'0488	0'2280	35°00	34°65	2'2600	1'7800	1'3800	Impure - -	64
18°80	4°20	2'7335	None	0'1390	28°07	24°71	0'7000	0'6600	0'1150	Unfit without careful filtration.	65
15°05	9°80	2'4394	None	0'1312	32°20	29°05	0'8200	0'7000	0'3430	Unfit. Well probably requires cleaning.	66
2°80	1°75	0'9424	None	0'0552	5°25	4°55	0'6000	0'6600	0'1150	Fit for use - -	67
31°50	5°25	4'3152	None	0'0572	37°80	36°75	0'2600	0'2200	0'1150	Fit for use - -	68
40°25	5°25	7'5888	None	0'0632	46°90	45°50	0'2200	0'1000	0'3450	Fit for use - -	69
31°50	3°50	8'5312	0'0272	None	49°70	47°60	0'1800	0'1000	0'2300	Fit for use - -	70
45°50	8°40	39'7792	None	0'2820	123°90	105°70	0'5400	0'3800	0'4600	Unfit for use - -	71
49°00	12°25	17'2112	None	0'2110	77°70	76°00	0'2200	0'1800	0'1150	Unfit for use - -	72
61°25	35°00	82'7481	0'1220	0'3450	197°40	195°53	0'7000	0'5800	0'3400	Unfit for use - -	73
17°80	8°75	7'2912	0'0528	0'0400	35°35	34°80	0'3400	0'2600	0'2300	Usable - -	74
52°50	21°00	69'2912	None	0'0528	145°65	144°20	0'7400	0'5800	0'5175	Unfit, except in case of emergency.	75

Of the 75 samples the following is the classification :—

"Fit for use"	-	-	-	28
"Usable, or requiring filtration before use"	-	-	-	17
"Unfit for use, on account of organic impurity"	-	-	-	24
"Unfit for use, on account of excessive hardness and chlorides"	-	-	-	2
"Unfit for use, both on account of organic impurity and of excessive hardness and chlorides"	-	-	-	4
Total	-	-	-	75

The following table gives the means of the analysis, similarly to that of last year.

TABLE of DRINKING WATERS according to purity.

No. of Samples examined.	Class of Water.	Chlorine in Grains per Gallon.	Ammonia in Milligrammes per Litre.			Oxygen required for oxidizable Matter in Milligrammes per Litre.		Nitrous Acid (NO ₂) in Milligrammes per Litre.	Hardness, in Degrees, of Clark's Scale.	
			Free or Saline.	Albuminoid.	Both together.	For Total oxidizable Matter.	For oxidizable Organic Matter only.		Total.	Fixed.
28	Fit for use	3.2260	0.0156	0.0200	0.0356	0.5165	0.2257	0.2350	19.00	5.71
17	Usable, or require filtration.	2.6920	0.0802	0.1195	0.1997	0.8282	0.6551	0.5292	10.62	3.96
24	Unfit, on account of organic impurity.	5.9017	0.1489	0.2095	0.3584	1.2725	1.0092	0.7853	15.33	8.51
2	Unfit, on account of excessive hardness and chlorides.	78.3950	0.2275	0.0745	0.3020	0.7000	0.5700	0.2750	70.00	39.40
4	Unfit, on account both of organic impurity and of excessive hardness and chlorides.	55.6425	0.2587	0.4838	0.7425	2.2200	1.7375	1.3450	65.09	48.98
(6)	Mean of last six	63.2267	0.2483	0.3473	0.5956	1.7183	1.3667	1.0217	66.72	45.78

In comparison with last year's table there are some differences.

In the first group, "Fit for use," the *chlorine* and the *hardness* are higher, the cause being the somewhat larger amount of chlorine in the Fort George, Gosport, and Cyprus samples, and the hardness of the Fermoy waters. Both the *free* and *albuminoid ammonias* are a little higher, but the *oxygens* are lower and the *nitrous acid* almost the same.

In the second group, "Usable or requiring filtration," there is a closer agreement with last year's results, the differences being unimportant.

In the third group, "Unfit, on account of organic impurity," there is an increase in the amount of *chlorine*, and a great decrease in the free *ammonia*, but otherwise the results correspond pretty well with those of last year.

The "hard" waters, which also contained a great deal of chlorine, were samples from Gibraltar, Towthorpe, and Sheerness. Both the two former were referred to last year. The Towthorpe supply was intended as the water for a large camp to be established in the district, but it is obvious that such a water could not be recommended, on account of its excessive amount of mineral constituents. Subjoined is a detailed analysis of a sample from that district.

ANALYSIS of a SAMPLE of WATER from TOWTHORPE.

Physical Characters.—Slightly yellow, no turbidity, some sediment, adamantine lustre, fair taste, no smell.

Microscopic Characters.—Mineral grit and sand, crystals of carbonate of lime, a little mycelium of fungi, but no trace of animal or vegetable life.

CHEMICAL ANALYSIS.

Quantitative Analysis.

	Parts per million.
Oxygen required for oxidisable organic matter -	0·5600
Ammonia free -	0·4950
Ammonia albuminoid -	None.
Nitric acid (NO ₃) -	0·2297
Nitrous acid (NO ₂) -	None.
Total nitrogen included in nitrates and nitrites -	0·0519
	Grains per gallon.
Volatile matter, including organic matter -	0·4357
Ammonium nitrate -	0·1517
Sodium nitrate -	0·1566
Sodium chloride -	2·5689
Sodium carbonate -	5·0000
Sodium silicate -	1·9485
Calcium carbonate -	14·8000
Calcium sulphate -	77·9800
Magnesium sulphate -	25·7295
Aluminium and iron phosphate -	2·8300
Water with calcium sulphate -	10·3209
Total solids -	141·9218
Total solids by evaporation -	141·8500
Difference -	0·0718

Remarks.

This water is quite unfit for a water supply on account of the large quantity of lime and magnesia and sulphuric acid.

With regard to the Gibraltar supply it is evident that waters of the characters of the samples, 71, 72, 73, and 75, are unfit for general use. In the event of great emergency they would be better than nothing, but nothing but real emergency could admit of their being recommended. As an example of the composition of the water, the following detailed mineral analysis is added.

SAMPLE of WATER drawn 9th October 1879 from trial shaft "Southport Ditch," Gibraltar. Received at Netley, October 25th, 1879.

Physical Characters.—Clear and colourless, little or no sediment, inodorous, taste sweet and saline.

Hardness:

	Clark's scale.	Metrical scale.
Total -	61°·25	87°·5
Fixed -	42°·00	60°·0
Removable -	19°·25	27°·5

	Grains per gallon.	Parts per 100,000.
Volatile matter -	13·300	19·00
Free ammonia, <i>nil</i> .		
Albuminoid, <i>nil</i> .		
Oxygen required for organic matter -	0·3900	Parts per million.
Nitrous acid -	1·2937	
Nitric acid -	55·0420	

	Grains per gallon.	Parts per 100,000.
Chlorine - - - -	70·757 -	101·08
Sulphuric acid (SO ₄) - - - -	11·754 -	16·79
Carbonic acid (CO ₂) - - - -	8·610 -	12·30
Calcium - - - -	8·084 -	11·55
Magnesium - - - -	7·053 -	10·08
Sodium - - - -	36·271 -	51·82
Silica - - - -	1·350 -	1·93
Alumina and iron - - - -	2·280 -	3·26
Other substances - - - -	0·391 -	0·56
Total - - - -	159·850 -	228·37

These constituents are probably combined as follows :—

	Grains per gallon.	Parts per 100,000.
Calcium carbonate - - - -	14·350 -	20·50
„ sulphate - - - -	7·970 -	11·38
Magnesium sulphate - - - -	7·660 -	10·94
„ chloride - - - -	18·192 -	25·99
Sodium chloride - - - -	86·679 -	123·83
„ nitrite - - - -	0·136 -	0·19
„ nitrate - - - -	5·282 -	7·55
„ silicate - - - -	2·167 -	3·10
Aluminium and ferrum chlorides - - - -	8·207 -	11·72
Organic and other volatile matter, besides nitrogen acids - - - -	9·357 -	13·37
Total - - - -	160·000 -	228·57

Free carbonic acid, about 9·1 cub. in. per gallon, or about 33 ccs. per litre.

Two of the samples from Sheerness contained a very large amount of mineral salts.

In consequence of a suggestion that spongy iron might be useful in arresting some of the salts, some experiments were made in an artificially prepared water (the Gibraltar samples being expended). The following were the results :—

REPORT on the EFFECT of SPONGY IRON on the SALINE CONSTITUENTS of WATER.

These experiments were made with reference to the Gibraltar water (Trial shaft, Southport Ditch) on which reports have been formerly sent in, a suggestion having been made that perhaps spongy iron might remove some of the excess of saline matter. The Gibraltar water itself having been all expended an artificial sample was prepared by mixing sea water obtained at high tide from Southampton Water, with ordinary tap water. The sea water contained 2,088 grs. per gallon of chlorides as chloride of sodium. Two parts of sea water were added to forty-five of tap water and the mixture analysed with the following results :—

Chlorine, 68·8842 grs. per gallon equal to 113·5134 grs. per gallon of chlorides as chloride of sodium.

Hardness :

	Clark's scale.
Total - - - -	23°·275
Fixed - - - -	22°·225
Removable - - - -	1°·050

This corresponded pretty closely with the Gibraltar water, so far as chlorides were concerned, although the hardness was less in the prepared water.

A new spongy iron filter, No. 3, Colonial pattern was tried, being first well washed with ordinary tap water, which contains only about 8 to 9 grs. of total solids.

After the filter was drained, five gallons of the prepared water were passed through and a sample taken; another five gallons were then passed through and the last bottleful taken.

The following table shows the results:—

Constituent.	A. Original Water, i.e., 2 Parts Sea Water to 45 of Tap Water.	B. Filtered Water after 5 gallons had passed through.	C. Filtered Water, last Bottleful after 10 gallons had passed through.
	grains per gallon.	grains per gallons.	grains per gallon.
Chlorine - - - -	68° 5842	69° 1824	69° 1686
Chlorides, calculated as sodium chloride - - - -	113° 5134	114° 0046	113° 8729
	Clark's Scale.	Clark's Scale.	Clark's Scale.
Hardness, total - - -	23° 275	22° 9250	23° 100
fixed - - - -	22° 225	21° 6125	22° 575
removable - - - -	1° 050	1° 3125	0° 525

It is obvious from the above that no influence whatsoever was exercised upon the saline constituents by the spongy iron filter, and that therefore any hope of diminishing their amount in this way must be abandoned.

The conclusion arrived at with reference to the Gibraltar water is, that it may be useful on an emergency, but that as an ordinary supply it cannot be recommended.

These results correspond with those of experiments formerly made, showing that mineral matters in solution are practically unaltered by filtration. The filter used was a new one, of the so-called Colonial pattern, a very compact and convenient form.

Nos. 18 and 19 (Fareham) in the table are interesting, as showing the differences of composition in the water from the top and from the bottom of a well; the chlorine in the latter being five times, the solids more than twice, and the hardness increased a half time as much as in the former. Most likely the well is affected by the tidal waters in its immediate neighbourhood.

On the other hand, Nos. 53 and 54 (Fermoy), drawn under similar conditions, viz., one from the top and the other from the bottom of the well, show practically no difference whatever, the periodic disturbing influence that was active in the Fareham well being absent in this one.

The impurity in the well of Golden Hill Fort (Nos. 26 and 27) appears to be partly accounted for by the manuring of the slopes.

The composition of the artesian wells at Lydd (Nos. 28 and 29) is remarkable, particularly that of No. 29. It is not uncommon to find chlorides and free ammonia in marked quantity, but so much albuminoid ammonia and indication of organic matter by the oxygen consumed can only come from some direct contamination.

No. 38 (Sheffield) is an example where the microscope comes to detect dirt getting into a well, before any marked chemical effect is produced. Another instance of this has occurred in Woolston, not far from my own house. A case of enteric fever having occurred and proved fatal, I obtained a sample of the water for examination. There was reason to believe that the disease was contracted elsewhere, but, as it was not immediately recognised, and as the well and cesspool were not far apart, I was desirous of ascertaining what the chances were of the disease poison being spread, seeing that the well supplied also an adjoining house occupied by a friend of mine. The water was such that by a chemical analysis alone nothing could be detected, except a very marked amount of nitric acid, and the water was reported pure by two different analysts. But microscopic examination showed, besides house refuse, such as fibres of clothing, &c., striped muscular fibre, apparently of fish, knotted fragments of paper disintegrated, wheaten starch cells, &c., all indications of faecal matter having found its way into the well. There can be no doubt that the presence of much nitric acid is a significant fact, which has not received its due weight, and if it be accompanied with an excess of chlorine, it is almost

alone a reason for rejecting water. This point is dwelt upon by Mr. Charles Ekin, F.C.S., in a very good little monograph on "Potable Water" (Churchills, 1880). He is, however, inclined to underrate the importance of microscopic examination. In the case above mentioned, I recommended that the water should not be used until it had been well boiled and filtered; the disease did not spread, but whether or not this was due to the precaution recommended it is impossible to say.

No. 3 (Aldershot) is another instance where the usual organic indications (albuminoid ammonia and oxygen required for organic matter) would have passed the water, particularly as the free ammonia is small. But the nitric acid was enormous (81 mgms. per litre), and the chlorine also large, so that there was no hesitation in condemning it as contaminated with sewage. The Aldershot supply, being so generally from shallow surface wells, is very unsatisfactory, as may be seen from the examples in the table. In the Dover samples we find No. 15 (rain-water) much more impure than Nos. 16 and 17 from wells. The water supply for the troops at Sandown, I. W., appears to be unsatisfactory, *see* samples Nos. 33 and 34. The three samples from Cyprus, Nos. 68 to 70, are fairly good, except that the carbonate of calcium hardness is considerable.

On the subject of the examination of water I propose to notice the two following works, both, but particularly the first, being useful additions to those existing :—

"WATER ANALYSIS for SANITARY PURPOSES, with HINTS for the INTERPRETATION of RESULTS." By E. FRANKLAND, Ph.D., D.C.L., F.R.S.

This is a valuable manual, one of the most important of the kind that has been published. The introduction contains directions as to the extent of the analysis necessary, the collection of samples, and the information to be obtained about them. The work is divided into two parts, the first describing the methods of analysing water, without the combustion process, involving gas analysis, and the second giving the details of that process. It was very desirable that these should be given as they had not hitherto been available in so complete and accessible a form. The author recognises the fact that the combustion process is only applicable in a fixed laboratory, where the somewhat complicated and expensive apparatus required is available. It is so far useless for general public service purposes, where the simpler methods must in most cases be the only ones possible to be carried out. It is satisfactory to observe that he gives due weight to the process for estimating organic matter by the oxygen consumed in the permanganate process in its different varieties, admitting also that its results correspond in some degree to those obtained in the combustion process for organic carbon. This is the position that we have claimed for it at Netley, and impressed upon the students working there (*see* Parkes' Manual of Hygiene, 5th edition, p. 86). The plan Frankland seems most to approve is that employed by Dr. Tidy, viz., to allow an excess of permanganate to act for three hours in the cold with sulphuric acid, and then to titrate back with hyposulphite of sodium, starch, and iodide of potassium. By comparison with the organic carbon results from the combustion process he has come to the conclusion that the following factors may be employed as an approximate method of determining the organic carbon from the permanganate method :—

<i>River water,</i>	oxygen consumed multiplied by 2·38=organic carbon.
<i>Deep well water,</i>	" " 5·80 "
<i>Shallow well water,</i>	" " 2·28 "
<i>Upland surface water,</i>	" " 1·80 "

Thus a river water, showing an amount of oxygen equal to 1 mgm. per litre necessary for oxidizing its organic matter, would contain approximately 2·38 mgm. of organic carbon; whereas the same amount would represent no less than 5·80 in a deep well water.

Tables of classification are also given, one for "Upland Surface Waters," and one for waters "Other than Upland Surface," in which the fact is recognised that more latitude must be allowed in the case of the former than in that of the latter, because the organic matter in the upland surface water is generally vegetable and of an innocuous character. There is, however, one point which

is, I think, not sufficiently regarded, and that is, the presence or absence of nitrous acid. Frankland says (p. 39) "It is rarely necessary to distinguish "between nitrites and nitrates in water," but he immediately afterwards admits the necessity of doing so with the Forchhammer or permanganate process. But the presence of nitrites is a most important indication, and may decide for us whether the pollution is recent or not. It is also clear that the use of the factors mentioned above would be very materially vitiated, unless the fallacy caused by the presence of nitrites were eliminated.

Frankland does not view the albuminoid ammonia process with much favour, merely referring to it as one employed by some analysts, but not described by him for reasons to be found in his papers in the Chemical Society's Journal. It must, however, be admitted that experience has shown that the results obtained by that process are sufficiently uniform to make them useful, although it is freely allowed that it only determines a portion of the nitrogenous matter. When, however, it is combined with the oxygen (or permanganate process) it gives information sufficient, in most cases, to decide on the character of a water, at least so far as chemistry can go at present.

"POTABLE WATER; how to form a JUDGMENT on the SUITABLENESS of WATER for DRINKING PURPOSES." By CHARLES EKin, F.C.S. (Churchills).

This little work (referred to above) is useful, particularly as it is written temperately and with much common sense. He points out the inadvisability of drawing hard and fast lines as to quantities in judging of the quality of drinking waters. Thus, Frankland lays down a standard of 0.10 to 0.15 of organic carbon and 0.03 organic nitrogen per 100,000; Wanklyn, 0.05 to 0.08 of albuminoid ammonia per 1,000,000; Tidy, 0.05 to 0.15 of oxygen required for organic matter per 100,000. On those points Ekin says, very pertinently, it is as if *six* typhoid germs were harmless, and *nine* hurtful. The truth is that *all* the conditions of a water must be considered. He lays especial stress on the importance of nitrates as a guide, and points out that the increase of typhoid fever in a wet season is probably due to sewage matter being swept too suddenly into the wells without undergoing nitrification in the soil. He cites the following interesting case:—In a village, population 100, typhoid fever is hardly ever absent. It stands on a table land of great oolite, the land sloping away on north and south sides. The porous rock on which it is built is from 40 to 70 feet thick. In this are side by side the drinking wells and privies. The water was analysed whenever fever occurred, but the organic matter was always very small. Proposals were made to drain the place properly, and the water was analysed again, when only two samples showed albuminoid ammonia in excess; but all contained large amounts of nitrates and were consequently condemned. Samples were then sent to another analyst who found the same results, but pronounced all the samples fit for use, and the place remains undrained to this day. Of course some nitric acid may find its way in from other sources, such as fossil organic matter and rain water. As regards the latter, Frankland recommends 0.032 per 100,000 to be deducted from the nitrogen of ammonia, nitrates and nitrites, as representing the amounts to be found in rain-water.

Purification of Water.—The question of filtration still occupies attention. I gave in last year's report the results of experiments on carfural as a filtering medium, with the intention of continuing the inquiry. The great pressure of work upon our laboratory and the inadequate space at our disposal have almost completely interrupted our experiments, and I can, therefore, present only one series this time. It affords, however, some information of interest. The filter used was a cylindrical earthenware one, about 20 inches in height and 10 inches internal diameter. The filtering material was carfural about one foot deep, the total quantity being about 0.5 cubic foot. The specific gravity of carfural is 2.879, and its porosity about 50 per cent; the actual weight of material would therefore be 44 lbs. nearly. The filter was in use for 14 months, all the drinking water for 14 to 16 persons being passed through it. As the water was naturally a fairly good one the test was not a severe one, but the results afford some information which may be useful as a guide.

FILTER EXPERIMENTS.

Cerferal Filter.

This filter was received from Major Crease on 1st April 1879. It was taken into use on 7th April 1879, and had been in constant use up to the time of experiment.

It was considered advisable to test this filter on 11th June 1880, as affording a fairly good practical test of the length of time the filtering material would remain efficient.

Experiments.

Series No. 1.

One cc., or thereabouts, of perfectly fresh albumen was added to one gallon of well water and passed through the filter and drawn off immediately. The first quart was rejected.

Constituents.	Original Water.	Filtered Water.
Total oxygen required - - -	2·0400 -	0·3800
Oxygen required for organic matter only	1·2400 -	0·2600
Nitrous acid - - -	0·2300 -	0·3450
Free ammonia - - -	None.	None.
Albuminoid ammonia - - -	1·1200 -	0·2560

The same water as in previous experiment was left in the filter, until there was a total exposure of 64 hours. Nearly one gallon was drawn off and sample taken.

Qualitative test. Nitric acid (NO_3) largely increased :—

Total oxygen required - - -	0·3900
Oxygen required for organic matter only - -	0·2600
Nitrous acid - - -	0·3737
Free ammonia - - -	0·0504
Albuminoid ammonia - - -	0·1560

The same water after a further exposure up to 88 hours :

Total oxygen required - - -	0·2200
Oxygen required for organic matter only - -	0·1800
Nitrous acid - - -	0·1150
Free ammonia - - -	0·0420
Albuminoid ammonia - - -	0·1340

Series No. 2.

20th June 1880. At 9 p.m. filter was washed with about five gallons of tap water, and drained as completely as it was possible.

A solution of white of egg was made, about 1 cc, to the gallon of tap water, and thoroughly mixed. One bottle was filled with a sample. About three gallons were put in the filter, and about one-third of a gallon drawn off at once and rejected. The water was left in the filter till 10 a.m. on the 21st, viz., 13 hours. About half-a-gallon was then drawn off and rejected, and then the bottle filled and tested as before.

Constituents.	Original Water.	Filtered Water.
Total oxygen required - - -	2·9400 -	0·7400
Oxygen required for organic matter only	1·7000 -	0·5000
Nitrous acid - - -	3·5650 -	0·6900
Free ammonia - - -	0·0456 -	0·0600
Albuminoid ammonia - - -	1·7332 -	0·5760

The same water after 37 hours' exposure to filtering medium :—

Total oxygen required	-	-	-	-	0·6600
Oxygen required for organic matter only	-	-	-	-	0·4600
Nitrous acid	-	-	-	-	0·5750
Free ammonia	-	-	-	-	0·0400
Albuminoid ammonia	-	-	-	-	0·4800

The same water after 85 hours' exposure :—

Total oxygen required	-	-	-	-	0·4600
Oxygen required for organic matter only	-	-	-	-	0·3400
Nitrous acid	-	-	-	-	0·3450
Free ammonia	-	-	-	-	0·1200
Albuminoid ammonia	-	-	-	-	0·3936

The same water after 119 hours' exposure :—

Total oxygen required	-	-	-	-	0·4200
Oxygen required for organic matter only	-	-	-	-	0·3000
Nitrous acid	-	-	-	-	0·3450
Free ammonia	-	-	-	-	0·1200
Albuminoid ammonia	-	-	-	-	0·3000

Series No. 3.

The carfilter was thoroughly washed and allowed to drain about four times.

A sample of well water was drawn and passed through the filter.

A second portion allowed to remain all night exposed to the filter, and a third drawn off at once.

1. Well Water (unfiltered), 8.30 p.m. :—

Total oxygen required	-	-	-	-	0·3000
Oxygen required for organic matter only	-	-	-	-	0·1800
Nitrous acid	-	-	-	-	0·3435
Free ammonia	-	-	-	-	None.
Albuminoid ammonia	-	-	-	-	0·1000

2. Drawn off (from filter) at 8.50 p.m. :—

Total oxygen required	-	-	-	-	0·2600
Oxygen required for organic matter only	-	-	-	-	0·1800
Nitrous acid	-	-	-	-	0·2300
Free ammonia	-	-	-	-	None.
Albuminoid ammonia	-	-	-	-	0·0460

3. Drawn off (from filter) at 10 a.m. :—

Total oxygen required	-	-	-	-	0·1800
Oxygen required for organic matter only	-	-	-	-	0·1800
Nitrous acid	-	-	-	-	None.
Free ammonia	-	-	-	-	None.
Albuminoid ammonia	-	-	-	-	None.

The same experiment is repeated.

1. Well Water (unfiltered), 4.40 p.m. :—

Total oxygen required	-	-	-	-	0·3400
Oxygen required for organic matter only	-	-	-	-	0·2600
Nitrous acid	-	-	-	-	0·2300
Free ammonia	-	-	-	-	None.
Albuminoid ammonia	-	-	-	-	0·1082

2. Drawn from filter at 9 p.m. :—

Total oxygen required	-	-	-	-	0·2200
Oxygen required for organic matter only	-	-	-	-	0·1800
Nitrous acid	-	-	-	-	0·1150
Free ammonia	-	-	-	-	None.
Albuminoid ammonia	-	-	-	-	0·0544

3. Drawn from filter at 10 a.m. :—

Total oxygen required	-	-	-	-	0·2200
Oxygen required for organic matter only	-	-	-	-	0·1800
Nitrous acid	-	-	-	-	0·2300
Free ammonia	-	-	-	-	None.
Albuminoid ammonia	-	-	-	-	0·0472

Series No. 4.

The carferal filter used in the previous experiments was thoroughly washed and allowed to drain.

Five grains of quinine sulphate, dissolved in half an ounce of distilled water with a few drops of dilute sulphuric acid were added to five gallons of tap water from the well, and passed through the filter. The first quart was rejected, as usual, before a sample was taken.

Organic Water :—

Total oxygen required	-	-	-	-	1·9000
Oxygen required for organic matter only	-	-	-	-	1·7000
Nitrous acid	-	-	-	-	0·5750
Free ammonia	-	-	-	-	None.
Albuminoid ammonia	-	-	-	-	0·5760

After 20 minutes' exposure in filter :—

Total oxygen required	-	-	-	-	0·1800
Oxygen required for organic matter only	-	-	-	-	0·1400
Nitrous acid	-	-	-	-	0·1150
Free ammonia	-	-	-	-	None.
Albuminoid ammonia	-	-	-	-	0·1120

After 23 hours' exposure :—

Total oxygen required	-	-	-	-	0·1400
Oxygen required for organic matter only	-	-	-	-	0·1000
Nitrous acid	-	-	-	-	0·1150
Free ammonia	-	-	-	-	None.
Albuminoid ammonia	-	-	-	-	0·0942

After 48 hours' exposure in filter :—

Total oxygen required	-	-	-	-	0·1100
Oxygen required for organic matter only	-	-	-	-	0·0700
Nitrous acid	-	-	-	-	0·1150
Free ammonia	-	-	-	-	None.
Albuminoid ammonia	-	-	-	-	0·0542

It will be seen from the above results that the carferal, after 14 months of ordinary use, still retained its efficacy nearly intact.

A new substance named "Stephan's patent carbonized iron-stone earth," has been proposed for filtration. It consists of so-called "iron-stone earth," a waste product in the mining districts, mixed with sawdust and burnt. The composition is said to be alumina, silica, magnesia, iron, and lime, and considerable powers of arresting colouring and other organic matter are claimed for it. It is not unlikely that many waste or easily obtained materials may be found useful in this way.

2. *Sewage, &c.*—One of the most interesting points with reference to sewage is the carrying out of the new works in the city of Memphis in the United States. This place has unfortunately acquired an evil renown for the severity of the yellow fever epidemics which have twice in succession smitten it. It was determined that energetic measures should be taken to prevent a third invasion, and a complete revolution in the system of excreta removal was accordingly decided upon. It may give some idea of the magnitude of the evil if we consider that in 1878, 5,000 out of a total population of 40,000 perished, and that, on an apparently equally severe epidemic making its appearance in 1879, it was actually proposed to obtain control of the city by subscription, and blot it out of existence for the purpose of saving the whole Mississippi valley from such a serious menace to its prosperity. Fortunately for the credit of sanitation this confession of ineptitude was not allowed to be carried into actual operation. A conference between the authorities and the National Board of Health ended in the appointment of a commission, who examined and reported that the whole place was reeking with organic filth, just as many a town or village is elsewhere, where, however, the cooler climate renders the conditions comparatively less active for mischief. It was determined to set to work at once, and the duty of carrying out the system of drainage was entrusted to Colonel Waring, well-known as one of the first sanitary engineers of the day. The plan adopted was the abolition of the privy vaults with which the city was filled, there being no less than 7,000 of them. Now there is not one. Within six months they were all abolished, and in their stead temporary earth-closets placed in the houses until the drainage was completed and proper waterclosets in connexion with it fixed. The general plan has been to make small sewers sufficient for excreta and foul water only, leaving the surface and storm waters to flow off by surface drains. This lessens expense as well as the chance of obstruction. The extensions from branch to main are funnel shaped, a 4-inch ventilating pipe is compulsory for each house, with a fresh-air inlet at the junction with the sewer. No pan or valve-closet is permitted; hopper-closets are encouraged. It is interesting to know that, in anticipation of a demand for them, the local tradesmen had got in a large supply of pan-closets. The authorities however, interfered, and all prohibited apparatus was returned to the manufacturers. One peculiar feature is that there are neither lamp nor manholes in any part of the system for two reasons: *first*, it is considered very unlikely that the sewers will ever get obstructed; *second*, the expense of breaking open the sewer when required will be less than the interest on the capital required for the manholes. This is the part of the scheme that is most open to question. In order to cleanse the sewers the excellent flush-tank of Mr. Rogers Field will be employed, which in its new form with the annular syphon is a most useful arrangement. There is every reason to hope for the most marked advantage from those changes which have been carried out with a rapidity and energy which reflect the highest credit upon all concerned.

A modification of Field's flush-tank has been introduced by Mr. Isaac Shone, of Wrexham, under the name of an hydraulic ejector. It consists of an earthenware tank which may be cheaply made; to it is attached a pipe which converts the whole into a syphon; as soon as the tank fills up the syphon is started by a tumbler basin, and the tank empties automatically. One objection to this is that, in the intervals of working there is a virtual cesspool at the bottom of the soil-pipe. Mr. Shone has already a pneumatic ejector for sewage, working on the exactly opposite principle to Liernur's, viz., with compressed air instead of exhaustion.

A novelty in ventilation of soil-pipes has been introduced by Messrs. Morton, of Manchester, the principle being to draw *down* the foul air through the soil-pipe, instead of letting it rise up. The foul air is carried up another tube assisted by a small hot-water coil at the point of ascent. The principle is a good one, but it would be better to assure the direction of the current by other means than artificial heat; for should the heat be arrested the current may be reversed. This might be done by fitting a trumpet-shaped cowl, with inverted conical cap, on the top of the soil-pipe, and a conical flange, with conical cap, on the top of the upcast pipe. The current might be assisted by the hot-air coil, but its direction would be independent of it. The method in question is obviously exactly the reverse of the "Banner" plan of ventilation.

A curious plan of disposal of sewer-gas has been suggested by Mr. H. C. Boulnois, C.E., surveyor to the city of Exeter. Instead of providing ventilators for the sewers opening to the air he proposes to make the sewer-air pass into the soil. This he calls "sewer gas annihilation." When the gas passed into true mould or earth this plan might possibly answer, but it may well be doubted whether it would not be attended with dangers in towns or near houses. Foul smells from drains and cesspools have been known to travel considerable distances: in one instance, I myself know of, foul air from a cesspool entered a sitting-room from a distance of 27 feet through a porous soil. We also know that coal-gas will travel a very considerable distance and under the foundations of a house, to such a degree as to produce fatal effects. Of course this is all the stronger argument for thoroughly impervious foundations, so as to cut off all danger of such accidents.

A very important paper was read in February of this year before the Philosophical Society of Glasgow: "An experimental investigation into the trap" and watercloset system, and the relation of the same to sewage products, "gaseous, and others." By Neil Carmichael, M.D., C.M., F.F.P.S.G. The author, after referring to Dr. Fergus' well known experiments on the passage of gases through the water seal of syphon and other traps, proceeds to investigate the question in its bearing upon the propagation of disease. By several ingenious experiments he shows that the amount of gas which will actually pass through is extremely small, amounting only to 7 grains (14 cubic inches) of CO_2 , to $\frac{1}{160}$ to $\frac{1}{200}$ of a grain of NH_3 , and to $\frac{1}{160}$ grain of H_2S in 24 hours; or from 0.0135 to 0.027 of a cubic inch of ammonia, and 0.028 of sulphuretted hydrogen. These are the maxima that can be got through even under favourable conditions. He brings forward arguments to show the infrequency of the transmission of disease through air, whether it be enteric fever, diphtheria, or ague, and this he attributes to the non-gaseous nature of the disease poisons, which he believes to be *particulate*, as is now pretty generally accepted. Particles are rarely, if ever, given off from water surfaces; and that they are not given off from sewage, except under the influence of the bursting of bubbles of putrefactive gases, has been shown by Frankland's experiments. It is, therefore, next to impossible that particulate matter should pass through water traps. This proposition he endeavours to prove by very ingenious experiments. Air from the surface of soil-pipe traps themselves was drawn into a Pasteur's solution, and also into urine, without producing any bacteria, all being previously sterilized by boiling. Two tubes were also placed together and connected with an india-rubber tube; each contained turnip infusion sterilized by boiling. Into each was introduced a sealed capillary tube, containing a putrid infusion; the whole was boiled for a few seconds. Then one of the tubes was violently shaken so as to break the capillary tube; this inoculated the infusion, so that fungi and bacteria developed. The other tube was watched, it being expected that germs would pass over into it, but they did not and have not done so during a space of five years. He concludes that, "Water traps are, therefore, for the purpose for which they are employed, that is, for the exclusion from houses of injurious substances contained in the soil-pipe, perfectly trustworthy. They exclude the soil-pipe atmosphere to such an extent that what escapes through the water is so little in amount, and so purified by filtration, as to be perfectly harmless; and they exclude entirely all germs and particles, including, without doubt, the specific germs and particles which, we have already seen, are, so far as known, distinctly *particulate*." He, of course, admits the dangers of imperfectly constructed traps, pressure in unventilated soil-pipes, bad joints, leakages, and the like; and by means of an ingenious experiment he shows that a pinhole in a leaden pipe will let germs through. "A hole, therefore," he says, "no larger than might be caused by a pin, is a source of danger vastly more than is a sound water trap."

These conclusions are extremely important; first, as establishing the efficacy of a good water trap; and, second, as demonstrating still further the danger of leaden soil-pipes. Some architects and builders still insist upon the use of drawn lead pipes, although the use of common *seamed* lead is discouraged. No doubt the former, made of sufficient thickness, is a great improvement on the latter, but in either case the danger is not removed, but only deferred. It is discouraging, however, to learn that in some new buildings (even hospitals)

in the course of construction soil-pipes of seamed lead are being introduced and carried down the inside of the walls. It may be mentioned, incidentally, that the importance of Dr. Carmichael's observations has been already recognised by the award of the Keith Gold Medal from the Royal Scottish Society of Arts.

3. *Air*.—Dr. W. Hesse has published a pamphlet, entitled “Anleitung zur Bestimmung der Kohlensäure in der Luft, nebst einer Beschreibung des hierzu nöthigen Apparates.” “Guide to the estimation of Carbonic Acid in the Atmosphere, with a description of the necessary Apparatus.” This describes an ingenious arrangement of portable apparatus for the determination of carbonic acid by a modification of Pettenkofer's method, using Baryta water with Rosolic acid as the indicator. In a subsequent communication Dr. Hesse states that he has substituted Strontia for Baryta and Phenolphthalein for the Rosolic acid. Oxalic acid is as usual used for determining the alkalinity. The portable apparatus consists of a good sized bottle of diluted Baryta water, containing a certain quantity of Barium chloride; flasks of different sizes, provided with india-rubber corks, pipette and burette, a bottle of standard oxalic acid solution, a two metre measure, an aneroid barometer, a thermometer, and a Wolpert's hygrometer. The Baryta bottle is provided with a syphon arrangement and a protecting bottle (containing pumice stone saturated with liq. potassæ) to prevent the access of CO_2 from the atmosphere when drawing off the solution. The flasks are gauged and marked to the point where the bung reaches, and they are filled with the air of the room by merely filling with water and then emptying again. The Baryta water and the oxalic acid solution are introduced by the pipette and burette having their ends thrust through apertures in the bung; by this means error is avoided which might arise from the rapidity with which Baryta (or Strontia) absorbs CO_2 from the atmosphere. He uses a solution of oxalic acid of 5·6325 grammes to the litre, 1 cc. of which equals 1 cc. of CO_2 . This simplifies the experiment and gets rid of one factor at least. By the further use of a table of factors for temperature and pressure much labour may be saved. Controlling experiments are recommended with flasks of different capacities as giving the best test of accuracy. Each experiment may be completed in from a quarter to half an hour, thus saving a great deal of time and ensuring more absolute correctness. Various details, into which it is unnecessary to go here, are given in the pamphlet, reprinted from *Eulenberg's Vierteljahrschrift für gerichtliche Medicin und Öffentliches Sanitätswesen*, N. F. XXXI. 2. The apparatus, conveniently packed in a leather satchel or wallet, is supplied by Emil Keller, in Schwarzenberg, at a price (complete) of 80 marks or 4*l.*, or the portable apparatus only, without aneroid, hygrometer, thermometer, metre measure, and compass, most of which would be likely already in possession of the experimenter, at a price of 25 marks 80 pfennings, or about 1*l.* 5*s.* sterling. The apparatus can also be applied to the determination of the CO_2 in the soil in a very convenient way.

“Några ord om mina nyuppfunna metoder att göra fartyg helsosamma och omöjliggöra farsoters uppkomst och utbredning om skeppsbord, jemte förslag till tidenliga och högst nödvändiga hygieniska förbättringar å fartyg, af med. Dr. Fredrik Eklund, Förste Bataljons Läkare vid Konigl. Flottans Station i Stockholm.”

“A few words on my newly discovered methods for rendering vessels healthy and preventing the rise and spread of epidemic disease on shipboard, with a proposal for timely and most necessary improvements in vessels. By Dr. Frederick Eklund, First Battalion Surgeon in the Royal Naval Station at Stockholm.”

This pamphlet gives a sketch of the various diseases met with on shipboard, and proposes prophylactic measures, the chief of which is the disinfection of the various parts of the vessel, including the bilges, with superheated steam. This method is recommended as more efficacious, more easily applicable, and less dangerous than the usual methods of fumigation.

4. *Food and Beverages*.—We have not had occasion to make any special food analyses at Netley lately, but in the subjoined table will be found a few of alcoholic beverages.

ALCOHOLIC BEVERAGES (analysed at Netley).

No.	Name.	Physical Characters.	Sp. Gr. at 68° F.	Alcohol, Vol. in Vol.	Solids.	Acidities—Grains per Ounce.			Remarks.
						Total.	Fixed.	Vo-latile.	
1	Sherry -	Slightly cloudy; colour rather high. Sweet, flavour unlike sherry.	0·9898	19	Per cent. 3·5	2·067	1·903	0·157	Too sweet, and too much fortified.
2	Sherry -	Clear; high coloured; no sediment; flavour hot, without any taste of sherry.	0·990	18	3·5	2·625	2·364	0·210	Too sweet; per cent. of grape sugar = 3·225; Dextrose = 1·918; Lævulose = 1·307; too much fortified; neither this nor the preceding sample real sherry.
3	Brandy -	Dark; slightly turbid; sweet smell; taste of coarse spirit.	0·961	29·5	traces.	0·0492	—	—	Apparently British brandy, largely watered; at least 30 per cent. of water added.*
4	Brandy -	Pale yellow; clear; no smell, but of weak spirit.	0·952	32	traces.	0·032	—	—	Much the same as above; 25 per cent. of water added.*
5	Brandy -	Pale; smell and taste weak spirit.	0·955	30	traces.	0·082	—	—	Much the same as above; 30 per cent. of water added.*
6	Pale Ale	Pale; clear; smell of ale, but strong; sweet; no bitter.	1·0065	5½	4·2	per pint. 19·25	per pint. 14·96	per pint. 8·40	Too strong for ordinary use.
8	Sherry -	Pale; flavour and smell not disagreeable; thin wine and poor.	0·9875	18	2·5	per ounce. 1·64	per ounce. 1·542	per ounce. 0·078	A poor wine; a deficiency of acid is probably one cause of its comparative insipidity.

* These quantities are calculated on the excise minimum of 25 degrees under proof.

Diseases propagated through Food.—The Medical Officer of Health of Glasgow (Dr. J. B. Russell) has published a "Report on certain Epidemic Outbreaks of Enteric Fever, in April 1880, with Appended Correspondence, &c." This careful report is an account of a cluster of epidemics of enteric fever which occurred in Glasgow and were traced to *milk* as the channel. This source of disease, although it is still somewhat scouted abroad, is now distinctly recognised in this country. Of course the milk, so far as yet known, is only a mediate agent, and acts by becoming the receptacle of disease poison, most probably by being mixed with water which has been contaminated with enteric poison. This mixing may be either for fraudulent purposes or may arise from the rinsing of the utensils with the infected water. The present report is noticeable for the careful way in which the inquiry was carried out and the evidence collected. The disease was clearly traced to sickness in a particular farm which supplied some of the milk, and where the sanitary arrangements were bad. The outbreak of the disease among the consumers of the milk took place just 14 days after the first distribution, and the last cases occurred just

14 days after the supply was terminated by order. This is the worst epidemic of the kind that has occurred in Glasgow, and it is satisfactory that it has been so well investigated.

Mr. W. H. Power, of the Health Department of the Local Government Board, has published a very interesting report on an outbreak of disease on board the reformatory school ship "Cornwall," which took place in September and October 1879. The disease was at first supposed to be enteric, but out of 43 cases, which occurred among 262 boys, only 18 were noted as severe, and only 1 death occurred. A previous outbreak had occurred in 1875, in which 50 per cent. of the boys suffered. This was then believed to be enteric, and to be connected with the outflow of sewage at Barking. The inquiry into that outbreak was, however, for various reasons incomplete. After a very careful inquiry Mr. Power came to the conclusion that the 1879 outbreak was more likely to be caused by some article of food than anything else, and the symptoms pointed to trichinosis. It was ascertained that some American pork had been consumed, but microscopic examination of such portions as were left failed to discover trichinæ. An order was obtained from the Home Secretary for the exhumation of the body of the boy who had died, and in the muscles and intestines trichinæ (or at any rate worms resembling them) were found. One alive and in motion was found in a muscle, but there were none encapsuled. The conclusion drawn by Mr. Power was that the outbreak was true trichinosis, and it must be admitted that his evidence is strong and that the inquiry was made with great care. At the same time the absence of trichinæ in the pork itself somewhat detracts from the value of the rest of the evidence, and it must also be mentioned that so competent an authority as Professor Cobbold, F.R.S., has expressed his opinion that the animals figured by Mr. Power are not true trichinæ. Should this be the case the report will still be valuable as indicating a line of inquiry into the nature of the organisms which must be followed out.

I shall conclude with an abstract of a very important report by Dr. D. D. Cunningham on the Medical Topography of Calcutta. The grouping of the facts is very interesting, even to those who do not feel it possible to go along with him in the conclusions he has drawn from them.

"MEDICO-TOPOGRAPHICAL REPORT ON CALCUTTA." By Surgeon-Major D. D. CUNNINGHAM, M.B., F.L.S., Professor of Physiology, Calcutta Medical College.

The following is a brief résumé of this important document. The author discusses the various conditions likely to influence the spread of disease, and then shortly considers the most important diseases themselves.

1. *Nature of the Soil.*—The alluvium has been bored to a depth of 481 feet; the surface consists of varying thicknesses of soil containing humus, lying over beds of loose sand and clay. It is very irregular, and there are even beds of peat at intervals. It is no argument against soil influence that localised outbreaks of any disease occur at different periods of the year. Houses situated over sand, clay, &c., or over flat or hollow beds, or over sloping or convex layers of clay, must be differently affected. It is a mistake to have houses so directly related to the soil as in Calcutta, where little or no provision is made against soil emanations. The digging of foundations for such enormous masses of masonry as the Calcutta houses necessarily favours emanations by going into the humus layer. Such houses are more dangerous than the mat structures of the poorer natives. The author favours buildings on piles; this, he says, is not a survival but a success in the struggle for existence. He compares Sikkim and Kumaon, in the former country the houses are on piles, with open spaces underneath, where the cattle, &c. are accommodated; the health is excellent. In Kumaon the houses are two-storied buildings of masonry, the animals being in the lower storey, but this is not open as in Sikkim; the result is that the place is offensive and the health bad; the *mahamari* or plague is frequent in Kumaon but unknown in Sikkim.

2. *Soil Temperature.*—At 3 feet from the surface the temperature ranges from a maximum of 85° F. at the end of May to a minimum of 68° F. in the middle of January. At 6 feet from the surface the maximum is 82° F. to 83° F. from end of May to the middle of July or August, according to the

rainfall; the minimum is 72° F. in January. So long as the weather is dry the fluctuations in the upper layer follow those of the atmosphere, but this ceases with the setting in of rain. The temperature of the lower layer fluctuates less; it is higher than that of the upper layer in cold weather, but cooler in hot weather; during the rains the two are nearly identical. The author is convinced that elevation of soil temperature is an important factor in oppressively hot weather.

3. *Ground Water Level.*—The maximum depth is 14·7 feet in May, the minimum 8·2 feet in September; the mean of the year is 12·4 feet, and the average annual fluctuation 6·4 feet.

4. *Fluctuations in the Carbonic Acid of the Soil.*—The maximum amount is found during the rains; the absolute maximum in the month of September. It diminishes in October, but continues till February; it then descends up to March or April, after which it increases. The variation depends chiefly on moisture obstructing the soil ventilation. The slight increase in May is perhaps due to increased decomposition attendant on heat.

5. *Atmospheric Temperature.*—Mean maximum 86·2° F. in May; mean minimum 67·7° F. in January; from May to October it is about 80° F.

6. *Humidity of Atmosphere.*—Mean maximum in August 88 per cent.; mean minimum in March 67 per cent. From June to October it is 80 to 88 per cent.; from December to March 67, 68 per cent.

7. *Atmospheric Pressure.*—The maximum is in December and January; the minimum in June and July.

8. *Rainfall.*—This may be divided into four periods: 1st, excessive, from June to September; 2nd, minimum, November to February; 3rd, intermediate, March, April, May; and 4th, also intermediate, October. The highest monthly fall occurs in August; the highest daily fall in June.

9. *Atmospheric Dust, &c.*—The mass of this suspended matter is determined by dryness and wind; the presence of spores, &c. is, however, unaffected by these influences as also by moisture.

10. *Local Conditions as affecting Diseases.*—The principal mortality is caused by cholera, diarrhoea, and dysentery, fevers and small-pox. There is distinct seasonal rhythm, which is most marked in cholera and small-pox. The reason of the difference may be that sometimes the disease may not prove fatal immediately on the reception of the poison, as in the case of fevers.

A. *Cholera.*—The mortality from this is low in January; it rises in February, and reaches its maximum in March and April. It diminishes in May and June until it reaches its minimum period in July, August, and September; it rises again in October and November, and falls in December. The coincident conditions are low ground-water level, free ventilation of the soil, and a relatively low atmospheric humidity. The depression in January below the ratio of mortality in November and December may be due to the lower temperature in the former month.

B. *Diarrhoea and Dysentery.*—The maximum mortality from these diseases takes place in the last quarter, the minimum in the second quarter of the year. The coincident conditions are stated as "humidity with depression of temperature." The author goes on to say, "One point seems worthy of remark, and that is, that there is no evidence of the existence of any common condition affecting local sources of water supply and simultaneously affecting the prevalence of cholera and bowel complaints."

C. *Fevers.*—The mortality from this cause is greatest in the third and fourth quarters; it diminishes in January and remains low until the third quarter. The author considers that they are imperfectly understood, and gives, as the coincident conditions, "depression of temperature and drying up of superficial accumulations of moisture."

D. *Small-pox.*—The mortality is at its minimum in the beginning of the cold weather; it rises through December, January, and February, to its maximum in March; it falls slightly in April, and rapidly through May and June to the low prevalence which characterises the rainy season. The cause seems to be dryness of atmosphere, causing disease particles to be carried about in the air. The depression of temperature at the time of initial rise probably favours contagion by leading to close aggregation of the population.

The author sums up as follows :—

“Where the phenomena of seasonal fluctuation in prevalence present themselves with sufficient distinctness and regularity to constitute a subject worthy of investigation, the question which has to be decided is : Are the seasonal fluctuations such as can be accounted for consistently with a belief in the development of the pathogenic agent within the animal organism and its propagation by transfer from one organism to another? In the case of small-pox it seems to me they are so ; in that of cholera they certainly are not.”

Such is a brief abstract of this report, the facts contained in which are very valuable, although I cannot admit that the author has made out his case so far as to justify his conclusions, especially with regard to the propagation and transmissibility of cholera and the persistent ignoring of the influence of drinking water as a factor in the transmission of disease. Without demanding for drinking water any exclusive influence in this way, I believe that, could we at all times and in all places ensure a supply of really *pure* drinking water, both cholera and enteric fever would cease to be a terror, even although they might not be entirely extinguished. Even of this consummation we need not despair, but I am sure it will not be reached until pure water supplies are secured.

APPENDIX No. II.

REMARKS ON ENTERIC FEVER (EXTRACTED FROM THE ANNUAL REPORT OF THE BENGAL PRESIDENCY, 1879, BY SURGEON-GENERAL T. CRAWFORD, M.D.).

By Brigade Surgeon J. A. MARSTON, M.D.. Secretary to the Surgeon-General.

1. As regards the etiology and causation of enteric fever, much and well founded uncertainty unquestionably exists. Even in Europe, where its connexion with a specific poison, or with the products of fecal or other organic decomposition contaminating air or water, seems to be established on a large and repeated number of observations—the cumulative effect of which amounts to very forcible evidence—it cannot be said that we have exhausted our knowledge of the causes of this fever.

2. But whatever be the causes, there can be no doubt as to its nature; enteric fever in India is, both in its clinical phenomena when taken as a whole, and in its post mortem appearances, perfectly identical with what is elsewhere known as enteric fever. That it may not here depend upon the real or assigned causes of enteric fever elsewhere is nothing to the point, seeing that we cannot pretend to have yet ascertained what all these causes are. We find however, that the fever process is a continuous and not an intermittent or remittent one; the temperature rises day by day and on the evening of each day, as in enteric fever elsewhere: the duration averages three weeks, and is often longer, and it is, in a considerable number of cases, characterized by an eruption of rose spots in successive crops appearing after the 6th or 7th day of the patient's illness; in short, it conforms to the description by which enteric fever is almost universally recognized.

3. Although it is perfectly true that the differentiation of enteric fever from other fevers may be very difficult or impossible where the period of observation is limited, the difficulty has, it appears to me, been exaggerated. Even in the absence of spots, the temperature and course of the symptoms in a case that has been under observation for a week or 10 days will, in the majority of instances, leave little or no reasonable doubt as to the nature of the disease.

4. But this being so, and it being conceded that enteric fever, setting aside its causation altogether for the present, is the same disease in India as elsewhere, the question may be asked:—Is enteric fever a specific disease like small-pox or scarlatina, for example, that is to say, is it allied to the other exanthemata?

5. The question has been answered in the affirmative by a large majority of the profession, including some of the best and most competent observers, by whom no doubt is entertained on the subject; still, so long as any uncertainty remains as to the causes of the disease, and so long as a minority of competent observers hold an opposite view, the matter cannot at any rate be regarded as beyond dispute.

6. There are some who might, it is presumed, contend that quite apart from the action of any specific cause or animal poison, enteric fever is a constitutional form of disease, accompanied by, if not dependent on, certain morbid changes in the intestine to which individuals were under certain conditions liable at certain ages, just as they are liable to tubercular disease, Bright's disease, &c.

7. The occurrence of "spots" in this fever would, however, tend to remove it from the category of non-specific diseases, for all constitutional diseases attended with spots or an exanthem may probably be regarded as specific in their nature—the affection of the skin being one of the most evident and characteristic expressions of blood poisoning of some kind. On the other hand it might be urged that as the spots seen in enteric fever do not make their appearance until the seventh day and onwards of the disease, and as their appearance often occurs in relapses of the fever, their presence is rather to be taken as an indication of something absorbed from the morbid lesions in the intestine,

and therefore as a secondary and not a primary phenomenon, that is to say, not as one of the expressions of a poison of which the enteric fever process is the outcome.

8. These are, however, pathological refinements with which we are in the meantime immediately concerned; the point which I desire to emphasise is this: that one of the most common and fatal fevers of this country is enteric fever; that it chiefly attacks soldiers during their first years of Indian service; that it appears to prevail, though unequally, both in the plains and the hills, especially during the hot and rainy seasons, and that by its symptoms during life, and by its pathological appearances after death, it can be recognised as genuine enteric or intestinal fever, and that, where the period of observation is sufficiently extended, it can be in a large majority of cases diagnosed by the conformity of its symptoms as a whole to the description given of enteric fever elsewhere.

I desire to call attention to the following tables, and more especially to those marked A. and B., the latter having been specially drawn up by Dr. Bryden for this office at my request, with the view of illustrating the influence of age (youth and early manhood) and recent arrival in India in this disease.

New tables illustrating influence of age and recent arrival.

MONTHS of the YEAR in which CASES and DEATHS occurred.

1878.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
Cases -	6	11	12	52	87	58	41	44	40	26	15*	8*	409
Deaths -	4†	4	5	11	23	35	17	15	17	23	6	8	168

* One died in 1879.

† One admission of 1877.

CASES and DEATHS among OFFICERS, WOMEN, and CHILDREN

1878.	Strength.	Cases.	Deaths.	Ratio per 1,000 of Strength.	
				Cases.	Deaths.
Officers - - -	1,268	12	3	9.46	2.36
Women - - -	2,868	6	5*	2.09	1.74
Children - - -	6,075	14	3	2.31	4.95

* One admission of 1877.

CASES and DEATHS distributed in the several DIVISIONS and DISTRICTS of the BENGAL COMMAND.

Division or District.	Presidency.	Allahabad.	Oudh.	Bolnecund.	Saugor.	Gwalior.	Meerut.	Sirhind.	Lahore.	Bawal Pindi.	Peshawur.	Total.
1878.												
Average strength	2,051	3,154	3,679	2,342	1,120	1,995	4,227	3,209	2,981	3,439	2,526	30,723
Cases - -	1	11	46	*56	15	*27	80	84	22	35	32	409
Deaths - -	1	7	17	26	9	14	23	†35	11	13	12	168

* One died in 1879.

† One admission of 1877.

DISTRIBUTION of ENTERIC FEVER among the various ARMS of the SERVICE during 1878.

Corps.	Average Annual Strength.	Cases.	Deaths.	Ratio per 1,000 of Strength to	
				Cases.	Deaths.
Cavalry - - - -	2,466	42	13	17·03	5·27
Royal Horse Artillery - -	1,676	32	19	19·09	11·33
Royal Artillery (Field and Garrison) - - -	4,750	63	22	13·26	4·63
Infantry (including Royal Engineers) - - -	26,455	272*	114†	10·28	4·30

* Two died in 1879.

† One admission of 1877.

RETURN showing the AGES of MEN attacked and died.

Ages.	Strength on 1st July 1878.	Enteric Fever.				Deaths at each Age from all Causes except Accident or Violence.	Proportion of Deaths at each Age per 1,000 of Strength from all Causes except Accident or Violence.	The relative Per-centage of Deaths from Enteric Fever to those from all Causes except Accident or Violence.
		Cases.	Deaths.	Ratio per 1,000.				
				Cases.	Deaths.			
22 years and under	5,034	167*	68	33·17	13·11	76	15·00	86·84
22 to 24 years	5,083	96	30	18·68	5·90	121	23·80	24·79
24 to 26 "	5,871	77	38	13·11	6·47	104	17·71	36·53
26 to 28 "	5,947	34	19	6·73	3·76	106	21·00	17·92
28 to 30 "	4,261	11†	2	2·68	0·46	63	14·78	3·17
30 to 35 "	5,614	17	9	3·02	1·60	101	17·99	8·91
35 to 40 "	3,472	7	3‡	2·01	0·86	77	22·17	3·89
Over 40 years	1,094	1	1	0·91	0·91	60	54·84	1·66
Not classed	205	—	—	—	—	1	4·87	—
Total	35,681	409	168	11·45	4·71	709		

* One case died in 1879.

† One case died in 1879.

‡ One admission of 1877.

YEARS of SERVICE in INDIA of the CASES and DEATHS from ENTERIC FEVER.

Period of Residence in India since date of last Landing.	Strength on 1st July 1878.	Cases.	Deaths.	Proportion per 1,000 of Enteric Fever.		Deaths from all Causes except Accident or Violence.	Proportion of Deaths at each Period of Service from all Causes except Accident or Violence per 1,000.	Per-centage of Deaths from Enteric Fever to Deaths from all Causes except Accident or Violence at each period of Service.
				Cases.	Deaths.			
1 year and under	5,089	206	80	34·39	13·35	168	28·06	47·61
2 years " -	4,516	75	28	16·60	6·20	100	22·14	28·00
3 " " -	3,477	25	11	7·19	3·16	103	29·62	10·67
4 " " -	3,090	35*	17	11·32	5·50	64	20·71	26·56
5 " " -	5,003	32	14	6·39	2·79	86	17·18	16·27
6 " " -	1,839	9	2	4·89	1·08	24	13·05	8·33
7 " " -	1,830	9	6	4·91	3·27	24	13·11	25·00
8 " " -	2,621	8	6	3·05	2·28	28	10·68	21·42
9 " " -	1,541	4	1†	2·59	0·64	24	15·57	4·16
10 " " -	1,695	2	2	1·17	1·17	25	14·74	8·06
Over 10 years -	3,875	4	1	1·03	0·25	62	16·00	1·61
Not classed -	205	—	—	—	—	1	4·87	—
Total -	35,681	409	168	11·46	4·78	709		

* Two died in 1879.

† Admission of 1877.

A.—STATEMENT showing the CASES of ENTERIC FEVER which occurred in the BENGAL COMMAND during 1878, classified according to periods of Indian Service, under each age severally from 22 years and under to 45 years, and showing respectively those that recovered and those that died under each head.

Periods of Indian Service.																									Cases under each Age.	
Age.	1 year and under.		2 years and under.		3 years and under.		4 years and under.		5 years and under.		6 years and under.		7 years and under.		8 years and under.		9 years and under.		10 years and under.		11 years and under.		Total Admissions.			
	Recovered.	Died.	Recovered.	Died.	Recovered.	Died.	Recovered.	Died.	Recovered.	Died.	Recovered.	Died.	Recovered.	Died.	Recovered.	Died.	Recovered.	Died.	Recovered.	Died.	Recovered.	Died.				
22 years and under.	78	49	19	10	3	4	1	5*	—	1	—	—	—	—	—	—	—	—	—	—	—	—	168			
23 years -	15	8	11	—	2	3	4	5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	48			
24 " -	13	5	7	5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	47			
25 " -	7	7	2	6	—	1	3	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	43			
26 " -	6	5	4	6	—	2	1	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	42			
27 " -	2	2	1	1	1	1	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	16			
28 " -	3	3	1	1	1	1	1	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	17			
29 " -	2	1	3	—	—	—	1	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	19			
30 " -	1	1	—	1	—	—	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4			
31 " -	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	6			
32 " -	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	4			
33 " -	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3			
34 " -	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3			
35 " -	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2			
36 " -	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2			
37 " -	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3			
38 " -	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3			
39 " -	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1			
40 and over	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1			
Total cases by periods of Indian Service.	127	79	47	29	13	11	16	19	33	18	14	7	9	3	6	2	6	4	1†	2	3	1	4	1705		
	206		76		24		35									8		5		2			400			

* One died in 1879. † Admission of 1877. ‡ One admission of 1877. § Includes one admission of 1877 and two deaths of 1879. ¶ Includes one admission of 1877 and one death of 1879. †† Death of 1879.

B.—STATEMENT showing the NUMBER of CASES in CORPS affected and DEATHS from ENTERIC FEVER in HER MAJESTY'S BRITISH TROOPS serving in the BENGAL COMMAND during 1879, classified according to ages and periods of Indian Service.

Strength of the Affected Corps on 1st July, 1930.		Ages.																		Proportion of Cases treated per 1,000 of Strength.	Proportion of Deaths per 1,000 of Strength.									
		Ages.																												
		18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35			Above 35	Total.							
Indian Service of Men treated and of Fatal Cases.	Distribution of Strength by Ages and Indian Service.	Below 20 years.						20 to 24 years.						25 to 29 years.						30 to 34 years.		Treated and Died.	Total.							
		1,208						9,230						7,965						3,373										
		18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	35 years and over.				2,504						
Under 1 year	-	4,674	Treated -	2	3	20	23	19	7	14	7	3	1	1	1	1	1	1	1	2	3	1	110	175	69	15.93	6.28			
1 year and under 2 years	-	3,973	Died -	1	1	9	6	10	3	5	1	2	1	1	1	1	1	1	1	2	3	8	45							
2 years and under 3 years	-	2,328	Treated -	1	1	4	10	11	4	2	1	1	1	1	1	1	1	1	1	1	1	15	23							
3 "	4 "	2,014	Died -	-	-	2	7	5	3	3	1	1	1	1	1	1	1	1	1	1	1	11	28	11	3.73	1.46				
4 "	5 "	2,121	Treated -	-	-	2	3	1	1	1	1	1	1	1	1	1	1	1	1	1	3	5					1	8		
5 "	6 "	2,830	Died -	-	-	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	4					4	4	4	
6 "	7 "	526	Treated -	-	-	-	-	-	-	1	1	1	1	1	1	1	1	1	1	1	1	1	3	9	5	2.34	1.30			
7 "	8 "	661	Died -	-	-	-	-	-	-	1	1	1	1	1	1	1	1	1	1	1	1	1	1					1	1	1
8 "	9 "	1,665	Treated -	-	-	-	-	-	-	2	2	2	2	2	2	2	2	2	2	2	2	2	2					2	2	2
9 "	10 "	988	Died -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	1			
Above 10 years	-	525	Treated -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	1	1	1			
Total	-	-	Treated -	4	4	24	28	38	17	21	14	13	12	8	7	1	4	3	1	1	4	3	212	85	2.34	1.30				
	-	-	Died -	1	1	12	10	18	7	7	4	4	7	2	4	1	2	3	1	1	2	3	85				35			
Proportion per 1,000 of strength	-	-	Treated -	13.79	13.79	5.36	5.36	5.36	5.36	5.36	5.36	5.36	5.36	5.36	5.36	5.36	5.36	5.36	5.36	5.36	5.36	5.36	5.36	5.36	5.36	5.36	5.36			
-	-	-	Died -	2.62	2.62	2.62	2.62	2.62	2.62	2.62	2.62	2.62	2.62	2.62	2.62	2.62	2.62	2.62	2.62	2.62	2.62	2.62	2.62	2.62	2.62	2.62	2.62			

(Signed) **JAMES L. BRYDEN, Surgeon-Major.**
Statistical Officer to the Government of India in the Sanitary and Medical Departments.

It is unnecessary to dwell on the significance of these tables. While the figures represent the results for those years to which they relate, it would rob them of their true meaning and significance to consider them as simply representing this and nothing more, for they are truly typical tables expressing what on a small scale and within narrow limits of time has been in the aggregate the experience of many successive years on a far larger scale.

The combined influence of age and recent arrival (and notably recent arrival) may be practically assumed as a very powerful factor in the production of this disease.

The European military population in this country may be said to constitute an experiment in pathology: for, while the population of any European metropolis consists of inhabitants from the age of a day to that of a century, we have in India a population composed almost exclusively of those ages most liable in all countries to enteric fever.

The European element in India constitutes an experiment in pathology.

This susceptibility or vulnerability of the European constitution in India is at its maximum during the first year, decreases during the second and third, and is practically nearly exhausted between the third and fourth years of an Indian residence; and it may be inferred from statistical deductions that it makes but little difference so far as the European soldier's chances of contracting enteric fever are concerned, whether he be 20 or 25 years of age on first landing in this country.

The period within which the susceptibility of the European constitution is chiefly exhibited.

In these respects the experience of 1878-79 are corroborative of the views put forward in my predecessor's report of 1877. It is necessary here to guard against a possible inference from these tables. While the young soldier newly arrived in this country exhibits this proclivity to enteric fever, his chances of contracting and dying of other diseases are much less than those of older and longer resident soldiers; in fact, the average expectation of life diminishes in this country, as at home, in proportion to age only in a far higher ratio.

The question suggests itself—What is the cause of this greatly increased proclivity of the soldier to enteric fever for a definite limit of time during which he appears to be acquiring an immunity from it by some process of physiological accommodation to his new surroundings, in other words, acclimatization? Causes thereof.

The soldier on landing in this country is placed under entirely new physiological conditions in regard to climate, food, and mode of life. The separate influence of some of these it would be difficult, if not impossible, to determine; but within the term climate are embraced heat and soil, and under the latter (soil) we may include malaria.

We should be able from numerical data to gauge the influence of these to some extent, and, with this object, Dr. Stephen, the Officiating Statistical Officer with the Government of India, has been good enough to furnish me with a tabular statement showing the relative mortality from enteric fever among a body of men arriving in India in October-November, as compared with a similar body disembarking in this country in March-April, together with some tables regarding the relation of other fevers to enteric fever.

No. I.—TABLE showing the ADMISSION and DEATH RATES due to ENTERIC FEVER during the First Two Years of their Service among the Troops who landed in India in the beginning of each Season (November) during the Years 1871-75.

Average Strength of Corps and Batteries during First Year of Service who landed in India in November 1871-76.	FIRST YEAR OF INDIAN SERVICE.				Average Strength of Corps and Batteries during Second Year of Service who landed in India in November 1871-76.	SECOND YEAR OF INDIAN SERVICE.			
	Enteric Fever.		Death Rate per 1,000 of Strength.	Admission Rate per 1,000 of Strength.		Enteric Fever.		Admission Rate per 1,000 of Strength.	Death Rate per 1,000 of Strength.
	Admissions.	Deaths.				Admissions.	Deaths.		
7,223	109	44	6.09	15.1	7,405	38	11	5.1	1.49
Total of the two years -					Admitted.	Died.		Admission Rate.	Death Rate.
					147	55	20.1	7.92	

No. II.—TABLE showing the ADMISSION and DEATH RATES due to ENTERIC FEVER during the First Two Years of their Service among the Troops who landed in India in the end of each Season (March) during the Years 1872-76.

FIRST YEAR OF INDIAN SERVICE.				SECOND YEAR OF INDIAN SERVICE.			
Average Strength of Corps and Batteries during First Year of Service who landed in India in March 1872-76.	Enteric Fever.		Death Rate per 1,000 of Strength.	Average Strength of Corps and Batteries during Second Year of Service who landed in India in March 1872-76.	Enteric Fever.		Death Rate per 1,000 of Strength.
	Admissions.	Deaths.			Admissions.	Deaths.	
	109	51	7.27		7,487	60	25
Total of the two years -				Total of the two years -			
Admitted.			Died.	Admission Rate.		Death Rate.	
169			76	23.3		10.48	

NOTE.—The admissions and deaths given in Table No. I. are for two full years, whereas in the 2nd Table the regiments were less than 24 months in the country.

From the foregoing table it would appear that arrival in India close to the advent of the hot season has not a very marked influence on the production of enteric fever.

It has been found impossible to obtain the materials for forming such a basis of comparison regarding the connexion, if any, between the prevalence of ague and enteric fever as would adequately meet the requirements of the case: for, it almost never happens that a newly arrived regiment is sent to, or serves in, a malarious station during its first two years of service in India, and it is, of course, extremely common for a malarious fever contracted at one station to manifest itself at another and relatively non-malarious station, it has consequently been found necessary to compare the total fever admission rate in certain corps and stations (febricula, ague, and other fevers) with that for enteric fever exclusively in other corps and stations: the length of service of the military body being in either case the same.

But we require here to meet and guard against another and probable solution of this problem. It may not be any constitutional resistance or accommodation to heat or other climatic causes, but to the poison of enteric fever itself that is acquired. The cause or germ of enteric fever once present in a station, barrack, or corps will depend for its development on certain favouring conditions of season and susceptibility of individuals exposed to its influence—heat and moisture may supply the first, fresh arrivals the second; and so the same place or corps may furnish a definite and continuous medical history of this disease for a successive series of years interrupted only by such intervals as could be accounted for by the absence of favouring season on the one hand, or susceptible individuals on the other.

Propagation by infection.

There is no doubt great difficulty in meeting an argument of this kind: for so long as the same barracks must be occupied year after year by different corps, there is a strong apparent probability, if enteric fever cases occur, of the existence of some continuity of descent underlying their history. As the troops engaged in the Afghan Campaign, however, occupied several positions that had probably never before been occupied by human beings, and as, in some instances at any rate, it was extremely improbable that the water-supply had been fouled, the campaign afforded an opportunity for excluding the influence of an infected soil or site, although not of an infected corps. The following tables do not embrace all the cases of enteric fever that occurred in the field, nor have all the reports been yet received; but they sufficiently indicate the distribution of the disease.

PREVALENCE OF ENTERIC FEVER in the different FIELD FORCES* composing the ARMY of AFGHANISTAN, 1879.

	January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.		Total.	
	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
—	3	—	1	2	4	1	5	—	41	9	12	8	3	1	2	8	1	2	1	—	3	2	—	—	76	28
Peshawur Valley	—	—	—	—	—	1	6	1	2	2	1	1	13	6	8	6	9	6	2	3	—	1	—	—	42	26
Kuram Valley -	1	1	—	—	1	1	4	1	1	1	—	—	—	—	2	2	2	—	—	—	1	—	2	1	14	7
Southern Afghanistan.	—	—	—	—	—	—	3	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	2
Marching back from Southern Afghanistan.	—	—	—	—	—	—	—	—	—	—	8	3	—	1	—	—	—	—	—	—	—	—	—	—	8	4
Marching back from Khyber.	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Total	4	1	1	2	5	3	18	4	44	12	21	12	16	8	12	11	12	8	3	3	4	2	3	1	143	67

* No cases occurred in Cabul.

NOMINAL ROLL OF EUROPEAN SOLDIERS who died in AFGHANISTAN from ENTERIC FEVER during 1878-79.

Corps.	Field Force.	Rank.	Name.	Age.	Service in India.	Date of Death.	Place of Death.
72nd Regiment -	Kuram -	Private	1878. J. Mc.L.	24	Yrs. 2	1878. 9 Nov.	Kohat.
F/A Royal Horse Artillery.	Do. -	Gunner	1879. J. M. -	21	1½	1879. 25 Sept.	Peiwar.
C/4th Royal Artillery.	Do. -	Driver -	J. C. -	25	4	29 "	Kohat.
2/8th Regiment -	Do. -	Private	I. B. -	22	1½	13 May	Do.
Do. -	Do. -	Do.	S. J. -	22	1½	22 "	Do.
Do. -	Do. -	Do.	J. W. -	24	1½	9 July	Peiwar.
Do. -	Do. -	Sergeant	H. P. -	29	1½	31 "	Do.
Do. -	Do. -	Private	G. S. -	22	1½	19 Aug.	Do.
Do. -	Do. -	Sergeant	T. M. -	21	1½	26 "	Do.
Do. -	Do. -	Private	J. F. -	22	1½	23 Sept.	Do.
Do. -	Do. -	Do.	R. B. -	23	1½	27 "	Do.
Do. -	Do. -	Do.	J. H. -	29	4	28 "	Do.
Do. -	Do. -	Do.	J. A. -	25	1½	2 Oct.	Do.
67th Regiment -	Do. -	Do.	T. L. -	27	6	22 Mar.	Kohat.
Do. -	Do. -	Do.	R. R. -	20	½	7 April	Do.
Do. -	Do. -	Do.	C. W. S. -	20	½	2 June	Kuram.
Do. -	Do. -	Sergeant	J. E. -	24	2	17 Aug.	Do.
Do. -	Do. -	Private	G. R. -	21	½	16 July	Bian Kheyl.
Do. -	Do. -	Do.	R. D. -	24	½	17 "	Do.
Do. -	Do. -	Do.	H. L. -	21	½	25 "	Do.
Do. -	Do. -	Do.	W. W. -	21	2	9 Aug.	Do.
Do. -	Do. -	Do.	W. S. -	19	½	13 "	Do.
Do. -	Do. -	Do.	S. J. -	21	½	10 July	Peiwar.
Do. -	Do. -	Do.	E. H. -	22	½	25 Sept.	Do.
Do. -	Do. -	Do.	G. W. -	24	½	8 Oct.	Do.
Do. -	Do. -	Do.	E. M. -	25	½	25 "	Ali Kheyl.
92nd Regiment -	Do. -	Do.	A. O. -	33	11	22 Aug.	Do.
9th Lancers -	Peshawar Valley, 1st Division.	Do.	J. C. -	22	1½	18 June	Peshawar.
Do. -	Do. -	Do.	A. B. -	26	4	28 "	Do.
H/C Royal Horse Artillery.	Do. -	Gunner	G. S. -	29	7	3 "	Do.
I/C Royal Horse Artillery.	Do. -	Do.	R. M. -	21	1½	26 "	Attock.
1/5th Regiment -	Do. -	Private	F. C. -	30	½	15 "	Peshawar.
Do. -	Do. -	Do.	J. C. -	24	½	23 "	Chuga.
Do. -	Do. -	Do.	R. C. -	25	½	28 "	Peshawar.
1/25th Regiment	Do. -	Do.	T. W. -	21	½	9 May	Peshawar Base Hospital.
51st Regiment -	Do. -	Do.	J. K. -	23	2	14 June	Do.
4th Battalion, Rifle Brigade.	Do. -	Do.	W. E. -	27	½	25 Mar.	Do.
Do. -	Do. -	Do.	W. B. -	21	4	20 June	Peshawar.
Do. -	Do. -	Do.	J. D. -	19	½	28 "	Do.
Do. -	Do. -	Do.	J. H. -	24	½	9 July	Do.
6th Dragoon Guards.	Peshawar Valley, 2nd Division.	Do.	L. S. -	24	1½	18 Nov.	Jellalabad.
Do. -	Do. -	Do.	A. W. -	23	1½	20 "	Do.
9th Lancers -	Do. -	Do.	S. W. -	24	4	5 Feb.	Peshawar Base Hospital.
C/3rd Royal Artillery.	Do. -	Gunner	W. P. -	23	½	17 May	Lundi Kotal.
1/5th Regiment -	Do. -	Private	H. M. -	23	1½	22 "	Do.
1/12th Regiment	Do. -	Do.	H. R. -	21	½	22 July	Do.
Do. -	Do. -	Do.	T. P. -	22	3	10 Aug.	Do.
Do. -	Do. -	Do.	R. V. -	22	3	4 May	Do.
Do. -	Do. -	Do.	A. S. -	23	½	8 "	Do.
Do. -	Do. -	Do.	E. P. -	20	½	17 "	Do.
Do. -	Do. -	Do.	J. N. -	22	2	19 "	Do.
Do. -	Do. -	Do.	G. O. -	21	½	23 "	Do.
Do. -	Do. -	Do.	W. S. -	22	3	31 "	Do.
Do. -	Do. -	Do.	T. H. -	36	3	10 Sept.	Do.
Do. -	Do. -	Do.	J. McL.	23	2	21 "	Do.
1/17th Regiment	Do. -	Do.	W. P. -	20	½	3 Aug.	Do.
Do. -	Do. -	Do.	C. B. -	24	4	9 "	Do.
Do. -	Do. -	Do.	G. U. -	38	9	16 June	Do.
51st Regiment -	Do. -	Do.	W. B. -	19	½	2 "	Peshawar Base Hospital.
A/B Royal Horse Artillery.	Southern Afghanistan.	Gunner	T. T. -	32	5	11 Mar.	Kandahar.
59th Regiment -	Do. -	Private	W. D. -	26	1½	26 Jan.	Camp Zuldak.
Do. -	Do. -	Sergeant	H. J. L.	33	11	21 Dec.	Kandahar.
2/60th Regiment	Do. -	Private	A. S. -	23	3	12 April	Do.
Do. -	Do. -	Do.	F. K. -	33	½	1 May	Do.

Corps.	Field Force.	Rank.	Name.	Age.	Service in India.	Date of Death.	Place of Death.
260th Regiment	Southern Afghanistan.	Private	1879. M. Q. -	21	Yrs. 1	1879. 20 Aug.	Kandahar.
Do. - -	Do. - -	Do.	J. A. -	19	1	21 "	Do.
70th Regiment -	Do. - -	Do.	G. S. -	20	1½	19 April	Do.
Do. - -	Do. - -	Do.	E. G. N.	18	1½	19 "	Do.

Relations of ague to enteric fever.

Very much has of late been written about the relations of ague and malarial forms of fever to enteric fever, and a term has been introduced for the purpose of designating a mixed or hybrid form of disease compounded of enteric fever and malaria—typho-malarial fever. This is no new question. The subject years ago attracted the attention of the Americans and French; but from a different standpoint to that now occupied. M. Baudens and other medical climatologists adduced several reasons for considering that ague and enteric fever were antagonistic to one another: that, in short, where the causes of ague, such as marsh miasm prevailed, enteric fever did not; that where these causes were reduced or rendered inoperative by drainage, ague was replaced by enteric fever, and that malarial cachexia was protective rather than otherwise against enteric fever.

Although it may be, and probably is true, that the two diseases are in no respect antagonistic, there is in reality no evidence to indicate any casual or essential connexion between them. Enteric fever is *not* a malarious fever; it occurs anywhere and in places where ague is unknown; and where the two diseases co-exist, they do not prevail contemporaneously, nor are those stations which are notoriously malarious specially remarkable for the prevalence of enteric fever—in fact, the reverse rather appears to be the case.

The admission rate for fever in any given corps or station stands in no relation to the prevalence of enteric fever in such corps or station. In the case of the 100th Regiment, for example, which disembarked at Bombay in November 1877, and proceeded to Jullundur, a very malarious station, the following table shows the medical history of the corps for the first 14 months after its arrival:—

STATEMENT showing NUMBER of ADMISSIONS and DEATHS, also RATIO of ADMISSIONS and DEATHS, from "ENTERIC FEVER," "OTHER FEVERS" (excluding Enteric), and "DYSENTERY," of the MEN, WOMEN, and CHILDREN of HER MAJESTY'S 100th REGIMENT during the PERIOD of OCCUPATION of JULLUNDER by the CORPS.

Corps and Station.	Average Strength.	Enteric Fever.				Fevers (excluding Enteric).				Dysentery.			
		Admis- sions.		Deaths.		Admissions.		Deaths.		Admis- sions.		Deaths.	
		Number.	Per 1,000 of Strength.	Number.	Per 1,000 of Strength.	Number.	Per 1,000 of Strength.	Number.	Per 1,000 of Strength.	Number.	Per 1,000 of Strength.	Number.	Per 1,000 of Strength.
		Number.	Per 1,000 of Strength.	Number.	Per 1,000 of Strength.	Number.	Per 1,000 of Strength.	Number.	Per 1,000 of Strength.	Number.	Per 1,000 of Strength.	Number.	Per 1,000 of Strength.
MEN.													
100th Regiment, Jul- lundur, Nov. and Dec. 1877	819	—	—	—	—	31	37·9	—	—	2	2·4	—	—
Ditto (including De- tachments), 1878	814	5	6·1	2	2·46	1,803	2215·0	12	14·74	142	174·4	11	13·51
Average strength for the period	816	5	6·1	2	2·45	1,834	2247·5	12	14·71	144	176·5	11	13·48

Corps and Station.	Average Strength.	Enteric Fever.		Fevers (excluding Enteric).		Dysentery.					
		Admissions.		Deaths.		Admissions.					
		Deaths.		Admissions.		Deaths.					
		Number.	Per 1,000 of Strength.	Number.	Per 1,000 of Strength.	Number.	Per 1,000 of Strength.	Number.	Per 1,000 of Strength.		
WOMEN.											
100th Regiment, Jullundur, Nov. and Dec. 1877	79	—	—	—	—	2	25.3	—	—	—	—
Ditto, 1878	65	—	—	—	—	81	1246.2	4	61.54	4	61.5
Average strength for the period	72	—	—	—	—	83	1152.8	4	55.56	4	55.6
CHILDREN.											
100th Regiment, Jullundur, Nov. and Dec. 1877	132	—	—	—	—	4	30.3	1	7.58	—	—
Ditto, 1878	120	—	—	—	—	76	633.3	4	33.33	12	100.0
Average strength for the period	126	—	—	—	—	80	634.9	5	39.68	12	95.2

Ague attacks men of all ages, Europeans and natives alike, while enteric fever does not; nor do any number of attacks of ague, except as these imply length of residence in India, confer an immunity from enteric fever. Moreover, enteric fever in no way responds to the influence of quinine, which is curative of ague.

TABLE showing the ADMISSIONS and DEATHS from ENTERIC FEVER and from all other FEVERS (Enteric excluded) during the First Year of Service.

(1.) In Corps and Stations with a high fever admission rate.

Year.	Regiments.	Station.	Average Strength.	Enteric Fever.		Other Fevers not "Enteric."	
				Admissions.	Deaths.	Admissions.	Deaths.
1874	4th Battalion, Rifle Brigade.	Umballa	864	4	1	420	—
1875	9th Lancers	Sialkot	459	5	2	200	1
1876	2/9th Regiment	Rawal Pindi	861	1	1	178	—
1877	34th " "	Ferozepore	929	18	6	753	3
"	A Brigade, E Battery	Umballa	160	1	1	79	—
"	" " "	Do.	156	1	—	34	—
1878	1/12th Regiment	Do.	880	9	1	272	1
"	C Brigade, A Battery	Do.	162	1	—	173	—
"	6th Dragoon Guards	Do.	450	28	10	301	1
"	2/8th Regiment	Rawal Pindi	911	15	3	901	3
"	100th " "	Jullundur	814	5	2	1,803	12
		Total	6,646	88	27	5,014	21
		Per 1,000 of strength	—	13.24	4.06	754.44	3.16

(2.) In Corps and Stations with a lower fever admission rate.

Year.	Regiment.	Station.	Average Strength.	Enteric Fever.		Fever not "Enteric."	
				Admissions.	Deaths.	Admissions.	Deaths.
1874	2/23rd Regiment	Hazaribagh	878	35	18	206	—
	13th Hussars	Lucknow	445	4	4	172	—
1875	1/18th Regiment	Bareilly	908	1	2	140	1
1876	XXI Bde, 1st Battery	Morar	94	1	—	33	—
"	" 2nd "	Gwalior	85	4	1	24	—
"	" 3rd "	Allahabad	86	—	—	40	—
"	" 4th "	Lucknow	85	6	1	53	—
"	" 5th "	Agra	85	1	1	54	—
"	1/25th Regiment	Fyzabad	900	18	10	323	1
1877	A Brigade, D Battery	Meerut	162	10	2	85	—
"	" G "	Lucknow	155	—	—	43	—
"	" I "	Meerut	159	3	2	44	—
"	4/60th Regiment	Agra	739	20	8	104	—
1878	2/2nd "	Bareilly	819	47	24	253	—
		Total	5,600	150	73	1,581	2
		Per 1,000 of Strength	—	26.79	13.04	282.32	0.36

	Enteric Fever.		Fever not "Enteric."	
	Admissions per 1,000.	Deaths per 1,000.	Admissions per 1,000.	Deaths per 1,000.
I.—In Corps and Stations with a high fever-admission rate	13.24	4.06	754.44	3.16
II.—In Corps and Stations with a lower fever-admission rate	26.79	13.04	282.32	0.36

TABLE SHOWING MONTHS OF MAXIMUM PREVALENCE OF "ENTERIC" FEVER.

Year.	Average Strength of Army of India.	Number of Admissions into Hospital in each Month.											
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
1874	59,308	10	9	15	25	21	20	29	34	39	14	10	17
1875	58,409	12	7	7	26	25	24	8	11	15	7	14	10
1876	57,553	25	12	11	15	41	20	19	28	40	25	12	16
1877	57,260	9	14	7	17	44	18	22	24	30	19	11	18
1878	56,475	15	10	20	47	73	64	49	40	68	56	18	19
	Total -	71	52	60	130	204	146	127	137	192	121	65	80
	Per-centage of admissions in each month.	5.13	3.75	4.33	9.39	14.73	10.54	9.17	9.89	13.86	8.74	4.69	5.78 = 100

ADMISSIONS from FEVER (excluding "ENTERIC"). TABLE showing MONTHS of MAXIMUM PREVALENCE of FEVERS not "ENTERIC."

Year.	Average Strength of Army of India.	Number of Admissions into Hospital in each Month.											
		January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
1874	50,308	1,183	945	1,514	1,641	2,013	2,292	2,803	2,852	3,990	3,331	2,797	2,012
1875	58,409	1,129	941	1,221	1,927	1,944	2,570	2,149	2,550	3,226	3,226	3,401	2,105
1876	57,358	1,252	1,400	1,004	1,293	2,365	2,100	2,212	3,041	3,704	4,714	2,868	1,853
1877	57,260	1,224	803	874	1,221	2,404	2,239	2,414	2,708	3,190	2,308	2,068	1,866
1878	56,475	1,256	977	1,053	1,747	1,832	2,239	2,920	2,822	5,568	7,531	5,633	3,910
Admissions for five years		6044	5,066	5,666	7,829	10,558	11,540	12,498	13,973	17,734	21,200	16,907	11,746
Per-centage of admissions in each month.		4.29	3.60	4.03	5.56	7.50	8.20	8.88	9.93	12.60	15.06	12.01	8.34 = 100

This subject has of late attracted much attention among continental, especially German, pathologists. Dr. Walder, assistant physician to the Zurich Hospital, has described a remarkable outbreak of the disease in question in connexion with the use of diseased meat at a choral festival held at Klotten, Canton Zurich; and similar occurrences have been described by other authorities in which a connexion between enteric fever and the same cause seems to have been established. Enteric fever prevailed largely among the men of 70th Regiment at Subathu in July and August 1879. A fatal disease made its appearance about the same time, and prevailed extensively among the sheep maintained by the commissariat for the supply of mutton to the troops. This disease in the sheep was characterised by fever; temperature ranging from 103° to 107°, diarrhoea and emaciation; and in some carcasses that were specially examined, in addition to other lesions, a diseased state of the intestinal and mesenteric glands was discovered. Out of about 500 men, to whom a ration of mutton had been supplied once a week, 21 had enteric fever. The proportion of men of over 24 years of age and two years' Indian service attacked was unusually large. On the presence of disease being discovered in the sheep, the issue of mutton was prohibited, and precautions were taken to secure that diseased sheep should not be slaughtered for food.

Enteric fever and diseased meat.

The issue of this Subathu mutton was stopped on August 3rd, the last case of enteric fever occurred on 20th August, that is, 18 days after the last issue of mutton.

The drinking water was pure, the source of water-supply at Subathu was reported to be quite satisfactory. On the whole, the circumstances as detailed made up a very consistent and forcible history in favour of the view that the enteric fever among the troops was attributable to the use of diseased meat, and to a local observer the foregoing facts could not fail of producing a definite and strong impression, if not conviction; but on reviewing the medical occurrences connected with the 70th Regiment, as a whole, I think this view would be certainly held to be unproven and most probably incorrect.

Of 34 cases and nine deaths from enteric fever in the 70th Regiment during 1879, the first case (not fatal) occurred at Mooltan on the 26th March; six admissions and four deaths while on the march to Subathu, three cases (one fatal in July) at Dagshai, and 24 admissions, of which four were fatal, at Subathu, where the first case admitted occurred on 21st April and the last on 20th August. The head-quarters of the regiment arrived at Subathu on the 23rd May 1879. It is evident that the disease, therefore, cannot be said to have been originally contracted at Subathu, but was, in fact, carried there.

It is frequently stated by medical writers in this country that enteric fever is a very common disease among the native population; nay, some have even represented that they are more prone to this disease than Europeans. I am

Enteric fever not a common disease among the native population.

not aware of any evidence on which such writers base their statements, but judging from my own experience and special inquiries directed to this end, they appear to be incorrect. This subject is one of vast importance in its bearing on the etiology and causation of enteric fever, for it is manifest that, if this disease be common among the native population, we need not go far to seek for the causes of its prevalence. The germs of the disease are sown broadcast throughout the country, fouling the water supply, or ready, when desiccated by the sun, to be blown about by any prevailing wind. Moreover, if it could be shown that under the name of diarrhœa what was, in reality, a mild and unrecognised form of this disease prevailed among native children, then, indeed, it might be argued with some plausibility that the enteric fever poison having exacted its tribute from the native in early life conferred an immunity on him from subsequent attacks—an immunity which was in no respect shared, however, by the newly exposed and adult European. From Dr. Bryden's statistics, from the medical superintendents of gaols, and other sources of inquiry, we learn the same fact, namely, that cases of enteric fever among the natives of India, especially such as have been verified by *post mortem* examinations, are rare. Opinions and beliefs based upon *à priori* considerations exist in abundance, but corroborative facts of which there should also be an abundance, are not forthcoming. Of course, it is not intended to deny the occasional occurrence of enteric fever in the native population. Of that there can be no doubt, but the ascertained number of such cases drawn from the vast population of India occupy an utterly insignificant position compared with the great mortality from enteric fever among the relatively small European population of this country. Is there such a thing on record in Indian medical literature among the outbreaks or epidemics of fever in native gaols of this country as one such epidemic of indubitable enteric fever, that is to say, where the clinical history, verified by the post mortem appearances, left no doubt?

Diagnosis of fevers in this country; the cause of its defects and difficulties.

I may remark, *en passant*, that the army medical officer is, by the regulations and practice of the service, to which he must conform, placed at a manifest disadvantage in regard to the diagnosis of disease. In order to furnish his returns promptly he has to classify a fever before the necessary time has elapsed for him to distinguish its nature. All fevers in their initial symptoms are much alike, and it is absolutely essential, as every educated physician knows, that a certain interval of time should elapse for a specific disease to develop its characters, and for the carrying out of those observations necessary to determine its nature. In army life accuracy of diagnosis is sacrificed to promptitude in classification, and a most undeserved reflection is apt to be cast upon the medical officer for unavoidable errors on his part, by his being compelled to do that which, in a disease like enteric fever in this country, is often most difficult and sometimes impossible in the absence of pathognomonic symptoms. Again, the mortality from enteric fever, as pointed out in my predecessor's report for 1877, affords no accurate index to the actual number of cases treated; for the ratio of mortality is much increased by the fact that many cases of enteric fever are never so classified at all, while, on the other hand, the list of fatal cases is unduly swollen by the addition of all those cases where the post mortem evidences have demonstrated the nature of the disease, or the extreme gravity of the patient's symptoms has led the attending medical officer to alter his previous diagnosis and relegate it to that of enteric fever. Nevertheless, there cannot be a doubt that the mortality from enteric fever is increased in India, in the way of heat-apoplexy and nervous exhaustion, by the heat conditions surrounding the subjects of it.

The mortality of enteric fever.

The experiment of sending a newly-arrived regiment to the hills.

My predecessor recommended in his report before quoted that, as an experiment, one or two regiments newly arrived in India should be at once sent to a hill station; and it was originally intended that the 2/5th and 30th Regiments should, on their arrival, be selected for that purpose, but the prolongation of the Afghan war put a stop to this experiment. The 2/5th went to Agra, and the 30th were encamped at Bareilly, with a detachment at Moradabad. The latter regiment marched to Ranikhet in April 1880. In the interval between the arrival of the regiment in February 1880 and May following there were 15 cases and 5 deaths from enteric fever. As the disease was unquestionably contracted at Bareilly, and was prevalent in the corps whilst encamped there prior to and at the time of its departure, the result of any experiment was completely vitiated in respect of the development of enteric fever in a regiment sent to the hills after its disembarkation at Bombay.

But in the meantime another and highly interesting experiment was taking place. Enteric fever continued to prevail in the 30th Regiment at Ranikhet up to July 1880; the 40th Regiment was stationed at Choubattia, in close vicinity to Ranikhet; these two corps arrived almost contemporaneously at their respective stations, the 30th, as has been said, having marched from Moradabad and Bareilly, and the 40th from Dum-Dum and Benares. The 30th Regiment was newly arrived in the country; the 40th had served seven years in India, and had as a corps suffered from malarious fevers. A fever was prevailing in both corps, and in their respective hospitals several fever cases were actually under treatment at one and the same time. It was at first considered that the two fevers might be one and the same disease, but a fatal case occurring in the hospital of the 40th Regiment demonstrated—that the clinical phenomena and temperature observations in the 40th hospital had previously indicated—that the two fevers were perfectly distinct.

80th and 40th regiments, forms of fever prevalent in these corps distinct.

In the case of the 30th Regiment the diagnosis of enteric fever was verified by the presence of those local lesions of the intestinal glands which are the invariable concomitant and anatomical expression of the disease, while in the fatal case in the 40th Regiment the intestine was found to be perfectly healthy. Appended are temperature charts, with brief notes of the cases, illustrating the course of the fever—climatic or malarious and ordinarily returned as remittent fever—in the 40th hospital; and by way of contrast some charts of enteric fever treated in the 30th hospital at same date (*vide* Appendix).

It is very difficult to find what may be termed a typical temperature chart of the fever cases in the 40th Regiment at Choubattia; they bear a strong likeness to one another, and to what may be seen in native hospital patients in Bengal; but in the present state of our knowledge it is not possible to differentiate these fevers into groups based on some definite anatomical lesion or other physical character.

Allusion has been already made to the great mortality caused by this fever, and it has been pointed out that such mortality cannot be accepted as affording a fair index of the death rate to the cases treated; still, the gross loss of life from enteric fever is very large, and it is impossible to avoid asking whether it cannot be reduced,—whether the fever-stricken soldier in this country is placed as regards his treatment in the most advantageous position practicable for his recovery?

The treatment of enteric fever unsatisfactory in this country.

The treatment of all fevers, and of enteric fever especially, hinges upon thoroughly efficient and watchful nursing, suitable diet, regulation of temperature, and the use of drugs to meet the varying requirements of the case—administered with sufficient foresight and judgment to just forestall those requirements.

I am afraid that none of the needs can be said to be as adequately and efficiently fulfilled as they might.

It would be difficult to select a more apt illustration than enteric fever of the way in which our treatment has been influenced by our knowledge. A very free use of stimulants and the right kind of food may save a patient's life at one time and jeopardise it at another.

A soldier, little more than a recruit, arrives in the country ignorant, of course, of its language, ways and customs; he contracts enteric fever and goes to hospital; it is probably the first time in his life that he has been seriously ill; he finds himself among strangers and new experiences, depressed and solicitous only for perfect quietude: as he gets worse, his headache is replaced by delirium, especially at night when his febrile state is exacerbated, and he wants to get out of bed and wander about the ward: at such time, and in the intervals of his being seen by the medical officer or medical subordinate, he has to depend for his nursing and the supply of his wants on a ward coolie—probably asleep in the verandah—supplemented, perhaps, by an equally ignorant soldier-nurse temporarily obtained from the ranks, who certainly has this advantage over the coolie that he and his patients do speak the same language. Again, as to diet, it is a matter of common sense, no less than of physiological knowledge to recognise that it is of the very first importance to a patient suffering from a fever mainly attributable to serious disease of the intestine that "his fever should not be fed" in the sense overfed; but that his diet, in quantity and quality, should be suited to his condition—supporting, and easily digested

and readily absorbed from his stomach, and not likely to decompose or to irritate the local lesions with which it comes in contact; and yet we occasionally encounter diet sheets in which are enumerated large quantities of milk, starchy compounds, beef-tea, soda-water or effervescing drinks with wine or brandy—and possibly as a medicine quinine in one or more large doses. Happily for the patient in some such cases it is believed not to be all consumed by him but by his attendants.

Again, as regards medical treatment, it is impossible for a medical officer always to watch his patient; he must depend upon his subordinates for information. In the large proportion of cases, perhaps, of enteric fever, opium is a dangerous remedy, but to the minority its administration may be highly essential. A medical officer desires to give it in small and repeated doses with a view to obtain the stimulating effects of the separate doses and the hypnotic effect of their accumulation, and in that way to guard against the injury of an overdose. For such a refinement of treatment the presence of a skilful or sagacious nurse is essential; in fact, in this and many other respects the only way to secure good nursing is for the attendant to register the events of the day, with the hours of their occurrence.

As regards any method for the cooling of fever patients, little or nothing is done; but there is no reason why these requirements should not be accomplished, or at any rate accomplished far better than at present.

The only way to secure these essentials is to have a trained Army Hospital Native Corps supplemented by a certain proportion of the European element for nursing purposes; a European cook to superintend the native cooking, for at present it is scarcely too much to say that no one in this country knows what he eats; a station hospital properly equipped and administered, with all the requisite appliances for carrying out what is the great design of a hospital, viz., the treatment and cure of disease; instead of having, as at present, numerous small hospitals, not one of which can be said to be equipped as perfectly as it should be, each a repetition of the other down to its minutest particular, involving a great waste of money, which properly applied in one direction would secure at any large station a hospital and hospital establishment as well equipped, administered, and conducted in its way, in its clinical aspects and details, as the best endowed London hospital. In such an institution it would become practicable, from the greater size of its establishment (*personnel*), to subdivide your labour and secure continuous and good nursing; and it might be practicable with punkahs and punkah-pullers and bhisties at command to apply some better and more systematic method for cooling the atmosphere surrounding the fever patient, or even for having attached to any such hospital a ward fitted with proper appliances for effecting this, such as Surgeon-Major Collis has devised and carried out for the treatment of heat-apoplexy at Meean Meer.

As an illustration of what so frequently occurs in India, viz., the appearance of an isolated case of enteric fever, the origin of which cannot be traced, the following may be taken:—

No. 349.—*Pte. D. H., 2/1st Foot.*

Stationed at Saugor.

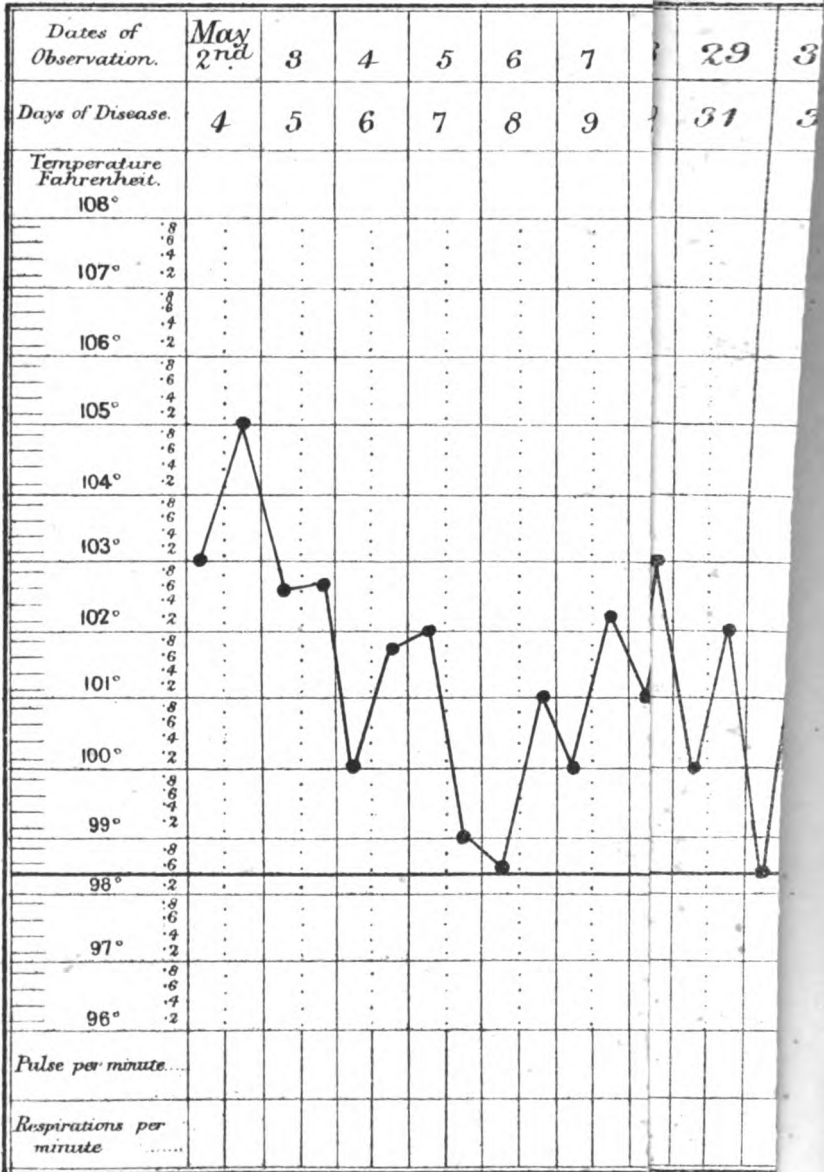
Age 24, service in India 4½ years.

Previous state of health.

Course of the disease.

Summary of Case.—This man was admitted into hospital on the 4th of April 1880, complaining of headache, loss of appetite, and thirst. Stated that he had been in good health until about a week ago, since which time he had been feeling out of sorts. On the 5th, the day following his admission, he had a morning temperature of 102° F., with an evening rise of 1·2° F., frontal headache being a prominent symptom. Diarrhoea set in on the 7th, and on the 11th the specific eruption appeared; the case, which had previously been returned as “not yet diagnosed,” was returned as “enteric fever.” The disease followed its usual course for the three week’s following the patient’s admission, the attack being a very severe one; the maximum temperature was 104° 4’, and the “typhoid state” well marked. On the 5th of May (the 32nd day of the disease) the patient had a relapse, marked by a return of the diarrhoea and an elevation of temperature, which lasted a fortnight. Recovery was further retarded by an attack of “phlegmasia dolens,” which set in on

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DANGERFIELD, LITH. 22 BEDFORD ST. COVENT GARDEN.

On the 8th of June; by July he was convalescent, and eventually returned to duty. Terminating recover

The detachment of which the patient is a component arrived in Saugor by route march from * Jubbulpore on the 17th march, just 18 days before the patient's admission into hospital. Time on the station. The weather was unusually hot for the time of the year, and the heat in tents during the day considerable; the men of the corps did not suffer from sickness, and reached this station in excellent health.

2. There were no cases of febricula, malarious, or continued fevers under treatment at the time the patient was admitted; no prevalence of diarrhoea in the corps. Health of the corps.

3. The last case of enteric fever occurring amongst the occupants of the infantry barracks at this station was in August 1878, the admission being from the same barrack (No. 13) as in this case. No connexion between the two can be assigned, as early in 1879 the whole barrack was dismantled, the plaster removed from the walls, the flooring, together with two feet of the earth below it, renewed, and the whole building re-roofed. Previous case.

4. No fault can be found with the barrack as regards its sanitary condition; the drainage in the vicinity is good, the latrines well kept, and the state of surface cleanliness entirely satisfactory. Barrack.

5. The water used by the men for drinking and cooking purposes is good, as evidenced by a rough analysis of it made by myself during the month of May, and by an examination of the wells from which it is drawn, there being no sources of contamination in their neighbourhood. Water for drinking purposes is drawn from a filter well. Water.

6. The sanitary state of the bazaars frequented by the men is good.

Bazaars.

7. The condition of the rations is also satisfactory.

Rations.

8. The case is altogether an isolated one.

P. M. ELLIS, Surgeon, A.M.D.,
in Medical charge Detachment 2/1st Foot.

Saugor, 27th August 1880.

40TH REGIMENT.

Choubattia, 16th June 1880.

Lance Corporal J. D.

Age last birthday	-	-	-	-	26 years.
Total service	-	-	-	-	8½ "

Admitted on 1st May. Came from Benares, where he was stationed. No admission on line of march; one admission, ague, 29th March to 4th April, at Chaubattia. This is his only admission for malarial fever since arrival in India. On admission was suffering from fever, had chills—pains in limbs and headache. It was supposed that the fever was malarial, and from its evident severity was returned as remittent fever. The symptoms, as disease progressed, were headache, large swollen white tongue, never got brown or dry. No eruption—bowels constipated, liver and spleen apparently normal. On 21st May some pain and emphysematous feeling over right iliac region noted, sweating occasionally profuse, accompanying falls of temperature. Sudamina on abdomen. Muscular pains in shoulders and arms. Slight bronchitis. Urine, slight trace of albumen. Specific gravity 1012. These symptoms have continued throughout; relieved by falls of temperature. Large doses of quinine given with no effect. He is now very anæmic, muscles much wasted, tongue clean and moist, appetite fairly good; bowels constipated, pains continue, does not convalesce; urine still has low specific gravity, 1012.

* The only case of enteric fever that can be traced at Jubbulpore from 1st January to end of May, was that of a recruit of the 2/9th Regiment, who contracted the disease on the march, and was admitted into hospital at Jubbulpore on the 19th January 1880.

40TH REGIMENT.

Choubattia, 10th June 1880.

Corporal W. J.

Casualty Report.

Age last birthday	-	-	-	-	23 years.
Total service	-	-	-	-	5½ "
Indian service	-	-	-	-	3½ "

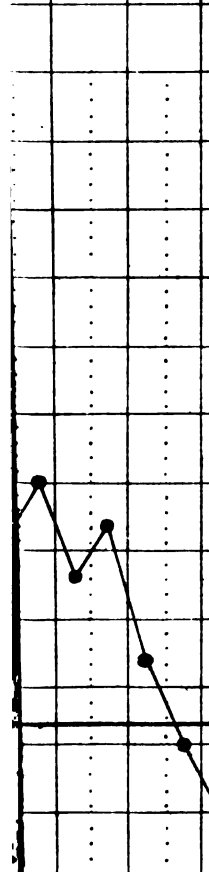
Admitted for ague on 19th March 1880; disease changed to enteric fever, 31st March 1880. On post-mortem examination, disease diagnosed as remittent fever. Died 10th June 1880.

General state of health previous to last illness, good. The only disease suffered from during the six months preceding last admission was febricula of six days' duration owing to exposure to the sun. He was admitted on the line of march on the 19th March 1880, the disease beginning with slight shivering, followed by fever, so that it first appeared like a case of ague, but it soon developed into one of continued fever, with morning remissions of fever, 1½ to 2 degrees, face flushed, tongue coated in centre and tip and edges. Bowels at first rather loose; no pain on abdomen on pressure; no spots. Slight cough with bronchitic sputa, no pain over spleen, no enlargement of that organ. He remained much in the same state till April 1st, bowels being opened occasionally, and morning and evening temperature varying very little, being between 102° to 103° F. On 1st April tongue began to get brown and cracked. Bowels opened several times, stools pea-soupy in character, slight gurgling in right iliac fossa, but no pain. No spots, no tenderness over spleen, no delirium. On 5th April, bed-sores began to form, pulse quick and feeble, hypostatic congestion of lungs present. On 16th April he was weaker, bed-sores worse, bowels inclined to be constipated, abdomen tympanitic, cough troublesome, mucous râles on front of chest. On 21st April, was delirious during the night, tongue dry, pulse quick and very feeble. On 23rd low muttering delirium, tremulous motions of muscles. Motions and urine passed in bed. On 25th same state, very weak, tongue dry and brown, sordes on teeth and lip. On 28th he was better, temperature fell to 98·4°. Tongue cleaner, bed-sores sloughing. From this date he gradually improved, gaining strength and flesh, bed-sores took on a healing character, slough having separated. Bowels regular, and motions more formed, though temperature still kept up. This improvement was such that he was able to sit up a little at the beginning of June. On the night of 7th June he was seized with acute pain over right hypochondriac region and vomiting as soon as any food was taken. When seen on morning of 8th, he was lying on left side, knees drawn up, face flushed and anxious, breathing rapid (36), pulse thready, and vomiting everything given to him. Bowels confined. On 9th continued the same. On 10th pain less, but pulse very thready. Conjunctiva yellow, vomiting continuous, bowels constipated. He gradually got weaker and died at 1.40 p.m.

Post-mortem appearances showed hypostatic congestion of left lung: soft infarction in upper lobe of right: enlarged and nutmeggy liver, enlarged and softened spleen, congestion and mucous catarrh of stomach.

Small and large intestines healthy—no enlargement of peyers or solitary glands—no traces of ulceration, nor any cicatrices discernible anywhere in the intestinal mucous membrane.

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Since the foregoing report was written the following interesting communication relating to an outbreak of enteric fever in the 44th Native Infantry has been received. As will be seen from information subsequently furnished by Surgeon O'Brien, the disease occurred among Goorkhas, a class of soldiers who may be regarded as occupying a somewhat exceptional position to other native soldiers as far as their proclivity to diseases of the European type is concerned, such as cholera, phthisis, enteric fever, &c. It is noteworthy that the Goorkha comes from a cold climate, and is a flesh feeder and spirit drinker like the European.

Outbreak of enteric fever in a regiment of Native Infantry. The habits and diseases of the Goorkha in some respects allied to those of the European soldier.

Shillong is 6,449 feet above the sea, and it may consequently be supposed that the spread of enteric fever in such a climate would be very similar to what it is in Europe, especially as the Khasias, the natives of the country, are flesh eaters like Europeans.

Copy of letter dated Shillong, 29th October 1880, from Surgeon J. O'Brien, 44th Native Infantry, to the Deputy Surgeon-General, Assam Circle :—

"In forwarding the accompanying digests of five cases of enteric fever in 44th Native Infantry, I have the honour to state that another case occurred in the regiment. A recruit lad, aged about 18, had a mild attack and recovered; as the hospital was full at the time of men suffering from ague, his case escaped special notice for some time, so the disease was not charged in the returns, but there is no doubt that it was enteric fever.

"2. A significant fact in connexion with these six cases, and one that leads me to believe that the disease was imported, is, that four of them were new arrivals in the station, and had come but a short time previously from Gowhatty, *e.g.*—

"Recovered case No. 1, the recruit lad passed through Gowhatty 22nd April, reached Shillong 26th, admitted 2nd May.

" " No. 2,* the recruit lad passed through Saitoo Goorung 28th, 29th April, reached Shillong, 2nd May; admitted 11th May.

" " No. 3,* the recruit lad passed through Bulleo Thappa 22nd, 23rd April, reached Shillong 26th April; admitted 12th May.

" " No. 4, the recruit lad passed through Bugbeer 6th, 7th September, reached Shillong 10th September; admitted 11th September.

"The other two cases were resident in the lines for a few months and must have received the infection locally.

"3. Two other cases are under my care at present in the 10th Native Infantry, both young men, under 25, just arrived from Gowhatty. They left Gowhatty on the 11th October, arrived in Shillong on the 15th, were admitted into hospital on the 20th and 21st October.

"4. While these cases point strongly to the probability of importation, others came under notice among the civil population in which there was no such history. Early in June I saw a Khasia girl, aged 14, suffering from unmistakable enteric fever in Umlynkha, a small village a mile beyond our lines. In June, July, August, and September, six or eight cases came under my observation in the village of Maskhar, all in one neighbourhood, viz., near the Mission Compound; two of these proved fatal. There were probably others among the more uncivilised Khasias, but they did not seek for medical aid. In August a mild case occurred among the English residents. In the same month an Eurasian clerk was attacked in the village of Laban. In September a fatal case occurred in the gaol. None of these people had been away from the station, so they must have contracted the disease locally.

"5. In this we have sufficient evidence to prove that there was a severe outbreak of enteric fever in Shillong between May and October 1880; the first case occurred in the lines of the 44th Native Infantry, and its history goes to show that the contagion was imported either from Gowhatty or from some place on the road between it and Shillong. I can only account for the outbreak in this way, in the lines of the 44th Native Infantry there are no glaring sanitary defects; the conservancy is defective, inasmuch as it is found to be

* Both ill for a few days before admission.

impossible to carry out the trench system in its integrity with the small regimental establishment, but there are no cesspools or foul stagnant water to which we might ascribe a spontaneous origin of the disorder. The water supply of the lines is also unquestionably bad and open to contamination, but it can hardly be charged with the causation of the disease, inasmuch as the six men who were affected obtained their drinking water from three different sources. Moreover, whatever sanitary defects exist now were equally prevalent in other years when there was no typhoid. I have had to deal with limited outbreaks of the disease among natives before now, and I am always on the look out for it, but I can say certainly that until the present outbreak no case has occurred in this station for the past couple of years. Thus it would appear to be most probable that the specific poison was imported on this occasion."

It is not considered necessary to reproduce the abstract of cases, suffice it to say that they were, as far as the course, duration, and symptoms of the fever and post-mortem appearances are concerned, indubitably cases of enteric fever. The following reply was received to a communication addressed by this office to the Deputy Surgeon-General, Shillong.

Copy of letter No. 207, dated Shillong, 4th December 1880, from Surgeon J. O'Brien, 44th Native Infantry, to the Deputy Surgeon-General, Assam Circle.

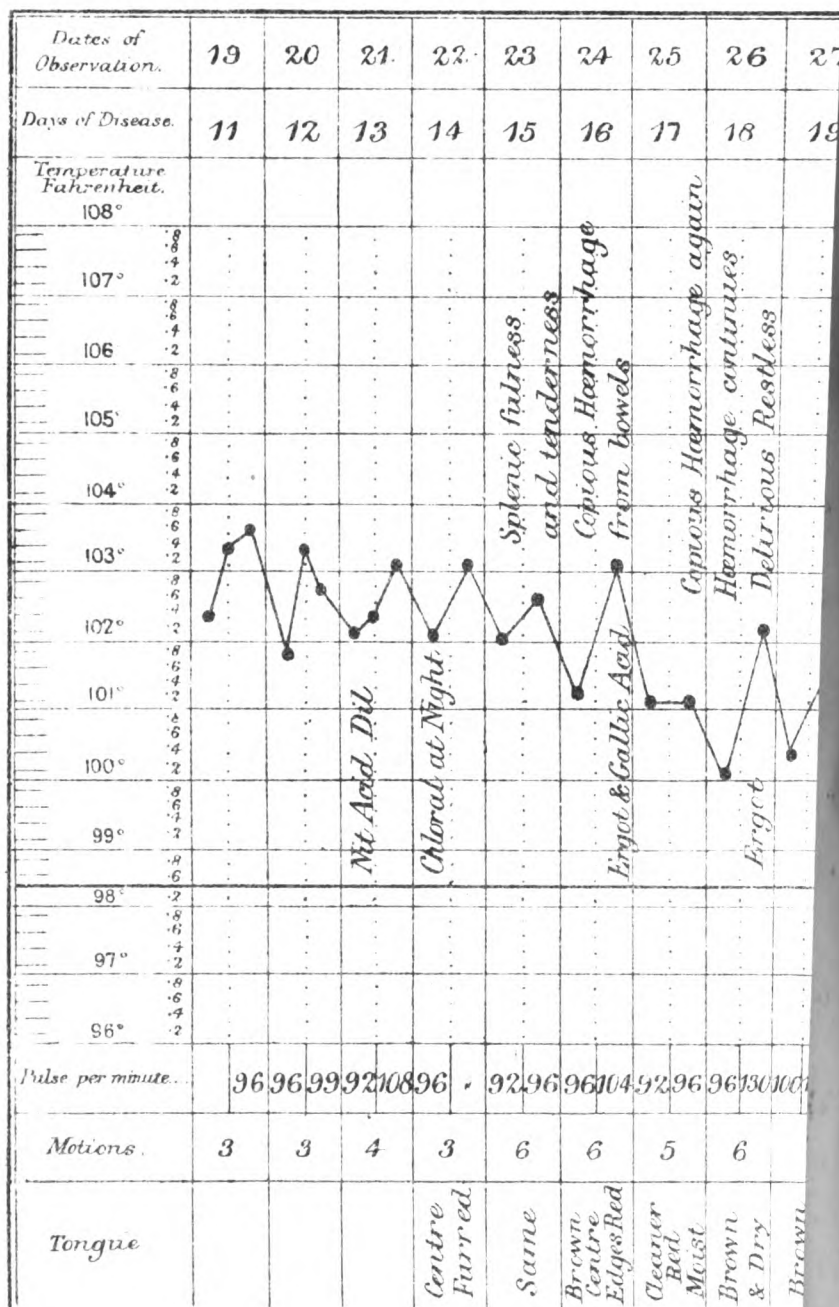
"In reply to queries contained in Secretary Surgeon-General, Military Department, No. 347/E., of 17th ultimo, I have the honour to state that the five men attacked by enteric fever in 44th Native Infantry, of whose cases I furnished digests, were all Goorkhas. In addition to these five, I have now under treatment two Goorkha recruits, one of the 42nd, and one of the 44th Regiment, both suffering from enteric fever.

"2. With regard to the second query, I have only seen one case of the disease this year, affecting a person who was not a meat eater. This was a Hindu prisoner in the Shillong gaol who died of intense prostration from the effects of the typhoid poison and from general enteritis caused by the violent onset of the lesion in the bowels. The other cases that I saw, some 12 in number, occurred among meat eaters, viz., one European, one Eurasian, and 10 Khasias (natives of the hills), of this number four Khasias died. All the people affected were young, only two or three being above 30; these 12 were permanent residents, had been dwelling in the station for a year or more.

"I regret to say that a post-mortem examination was not permitted in any of the fatal cases, but they were unquestionably instances of the same disease as that which proved fatal to the five sepoy, *e.g.*, one died of hæmorrhage from the bowels about 23rd day of illness, two died of extreme nervous prostration and insomnia, the 4th, a child, died in a state of high fever and delirium. Hæmorrhage from the bowels and diarrhæa were also prominent symptoms in some of the other cases.

"3. In conclusion, I must say that the origin and causation of the disease is still, to me, after much reflection, a mystery. I can certainly say that for many years now there have been no cases of it in the station, yet we have had conditions almost similar to these which prevail at present. There have been every year almost similar sanitary or insanitary conditions, new Goorkha recruits, and a large population of the gross feeding, meat eating Khasias about, still no enteric fever. In the present year the disease crops up, first case noticed about May; I can only account for it by the easy theory of importation of a special poison. As the first cases occurred amongst new arrivals in the station, and within a week or so of their arrival there is much to be said in support of this view. Besides the cases that occurred were grouped to some extent, *e.g.*, the four cases that occurred in the village of Moorkha, all lived close to the Mission Compound, three cases in the village Umlynkha lived two in one house, the other close by; there was of course much intercourse between the six people affected in the 44th lines. Thus, as far as I can see, it would appear probable that a special and slightly communicable poison was introduced or locally generated in 1880 that did not exist in other years."

In a very interesting report by Dr. Crombie, Civil Surgeon of Rangoon, on the diseases of British Burmah for 1875, this medical officer points out that ague is a much more common disease among the foreign population of Burmah than among the natives of that country. Dr. Crombie dwells upon the rela-



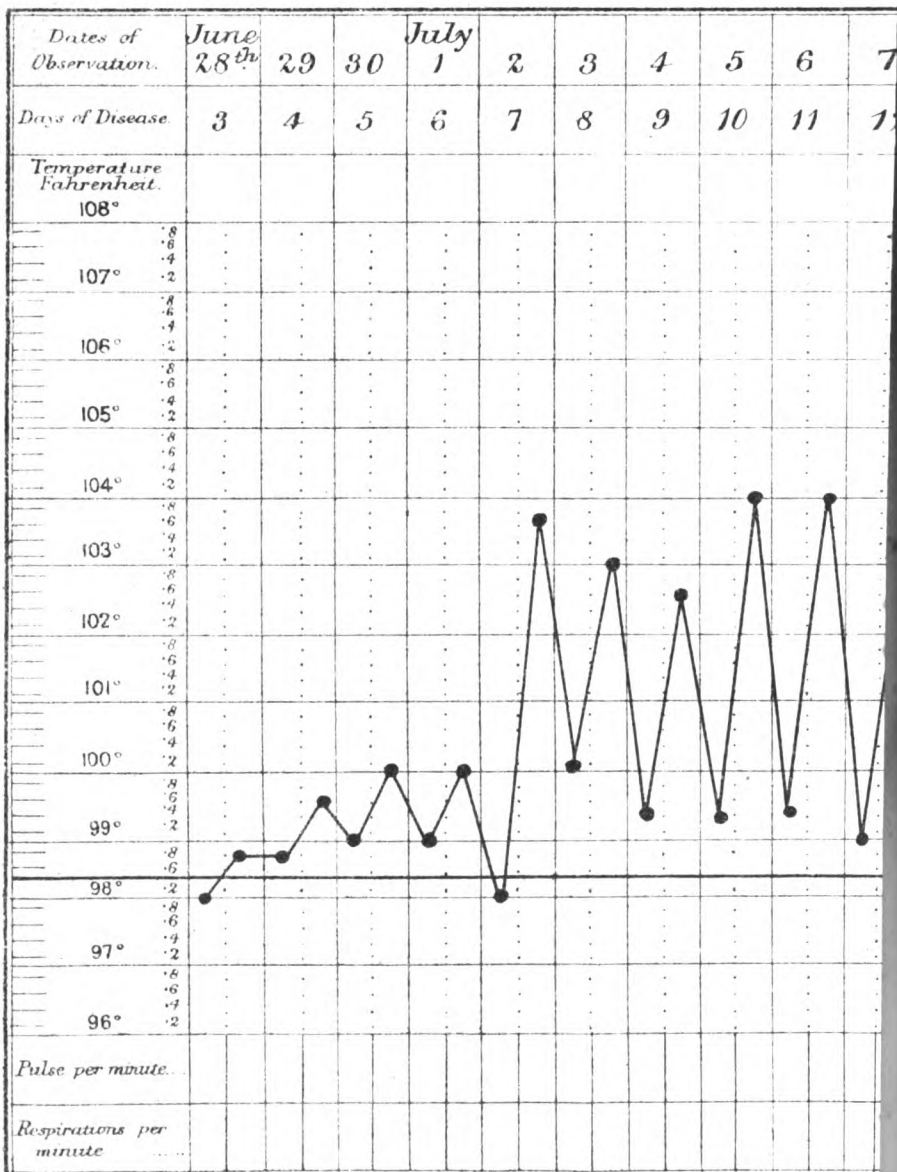
RECORD

Corps

26	27
18	19
Hemorrhage cutaneous	
Delirious Restless	
Ergot	
96130100	
6	
Brown & Dry	
Brown	

RECORD

Corps 40th Reg^t Pst



DEVEREUX L. 22 BEDFORD ST COVENT GARDEN

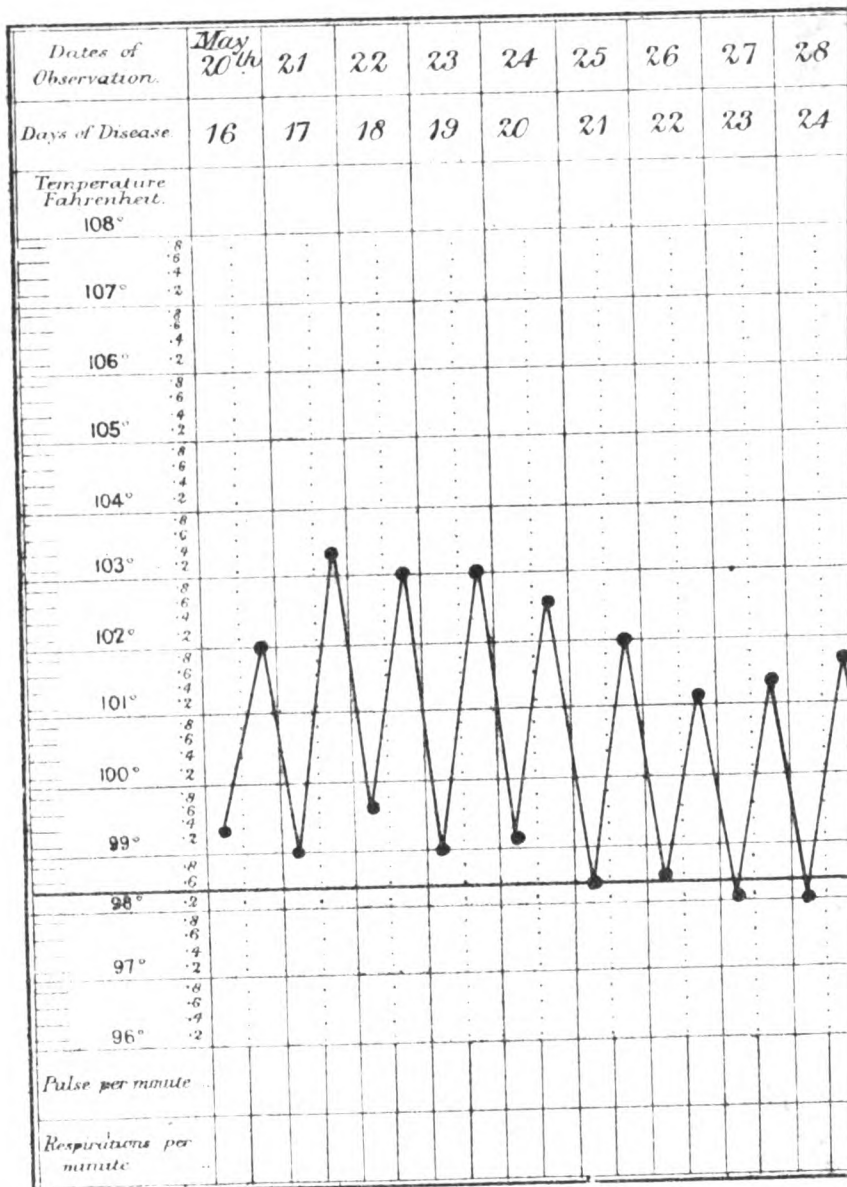
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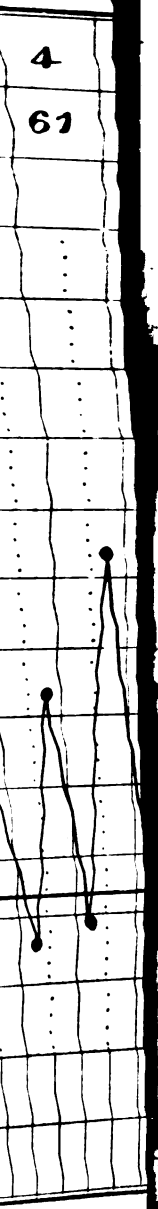


RECORD

Corps 40th Corp^l



DIAGNOSTIC THERMOMETER, LONDON



Dates of Observation.	May 8 th	9 th	10 th	11 th	12 th	13 th	14 th	15 th	16 th
Days of Disease.									
Temperature Fahrenheit.									
108°									
107°									
106°									
105°									
104°									
103°									
102°									
101°									
100°									
99°									
98°									
97°									
96°									
Pulse per minute.	104	96	100	100	100	104	102	108	102
Motions.			4	0	0	2	2	3	6
Tongue.	Centre foul	Red edges Moist		Foul Red Edges	D°	D°	Dry Sordid	Dry Brown Red Edges	Brown Dry

Corps 3.

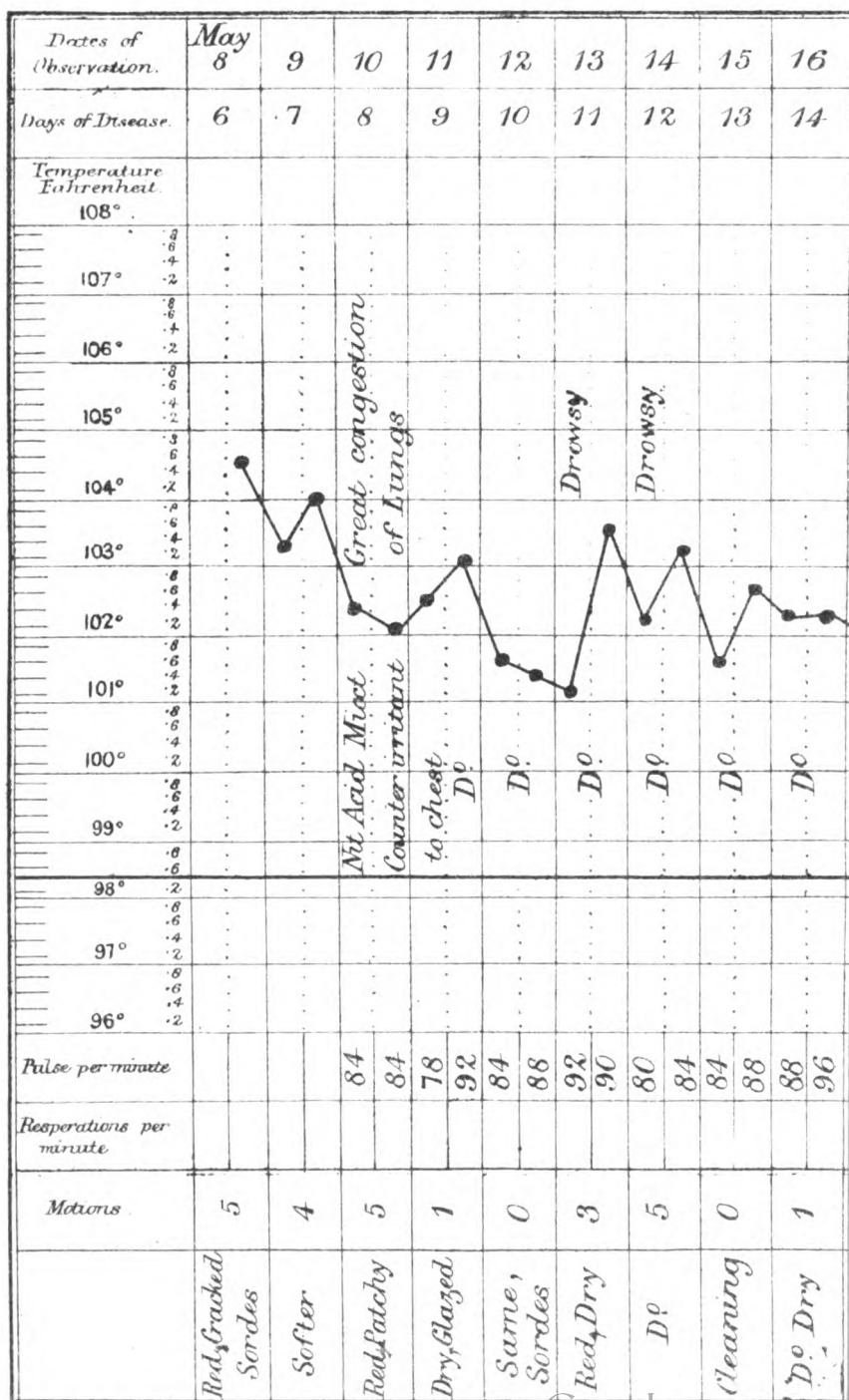
th 16th

Delirious at night

Chloral Hydrate

128

dry



Ca

16

14

		June					
		1	2	3	4		
D°	2	96				D°	
		100					
D°	3	100				D°	
		108					
Dry	3	108				D°	
		110					
Brown & Hard	4	108				D°	
		110					

tively small number of Burmans affected with enlarged spleens, which may be taken as the readiest test of severe malarial poisoning. Out of 145 post-mortem examinations he found enlargement of the spleen in only four cases, one of whom only was a Burman, and he enters into the causes of this difference in connexion with certain physical conditions of the delta of the Irawaddy and Ganges respectively, and the elevation on piles of the native houses in Burmah. Dr. Crombie describes three cases of undoubted enteric fever, verified by post-mortem examination among Burmans and Talincs who were the original inhabitants of Burmah, and like their subjugators (the Burmese) flesh eaters. He states that in an experience of two years in the Calcutta Medical College Hospital he only met with one undoubted case of enteric fever.

On the other hand, the immigrants, mostly natives of Lower Bengal, thrive very badly in Burmah, suffer much from ague and occasionally present every variety of evidence of malarial poisoning, and are in general physique also inferior to the natives of Burmah itself.

4
19
in passing through
Typhoid & enteric

enteric irritation

4

4

4

APPENDIX No. III.

REPORT ON THE CASES OF FEVER FROM CYPRUS, MALTA,
AND GIBRALTAR, THAT WERE TREATED IN THE MEDICAL
DIVISION OF THE ROYAL VICTORIA HOSPITAL, NETLEY,
DURING THE YEAR 1879.

By Surgeon-Major H. VEALE, M.D., Assistant Professor of Military Medicine.

I.—GENERAL REVIEW OF THE CASES RECEIVED DIRECT FROM CYPRUS.

The European portion of the force that was despatched to Cyprus in July 1878, consisted of the 42nd, 71st, and 101st Regiments, which had previously been stationed in Malta for several years, and also of small detachments of the Royal Engineers, Army Hospital Corps, and Army Service Corps, which were sent out direct from England. All of these troops suffered more or less from fever, and in the course of a few months a considerable number of them had to be sent home to Netley as invalids. Some idea of the inefficiency that resulted from their residence in Cyprus may be gathered from the statement that, before the close of 1878, 96 *invalids* were received into the medical division of the hospital, in addition to many others who had been sent home as *time expired* men; that, in the early months of 1879, 25 more invalids were received direct from Cyprus; and that, in the course of this year, 106 others were admitted from the regiments which had served in Cyprus, but which had subsequently been removed either to Gibraltar, or to Halifax in Nova Scotia.

At least nine-tenths of those who came direct from Cyprus were suffering from malarial fever or its effects, as was evidenced by their sallow, worn, and cachectic aspect, but still more certainly by the fact that many of them were actually in the cold stage of ague when they arrived. Of those who came home not directly from Cyprus, but after having been subsequently stationed in Gibraltar or Halifax, a large number suffered from unmistakable malarial fever, but among the remainder there were many in whom the fever assumed a form concerning which I propose to enter into some detail hereafter.

On comparing the diseases for which the men were invalided with those that were subsequently diagnosed at Netley, it is remarkable that whilst in Cyprus, the cases of remittent fever exceeded those of ague, at Netley the cases of ague largely exceeded those of remittent fever; and the difference was so considerable as to justify the belief that it was owing to a change having occurred in the type of the disease.

The account that the men gave of their ailments in Cyprus was tolerably uniform. They said that, shortly after their arrival in camp, they suffered from a fever of sudden access, and without rigors, which was attended with pain in the back and limbs, vomiting, thirst, constipation, and great prostration of strength. After a period varying in different cases from three or four days to as many weeks, they would return to duty, but were soon seized again with another attack of a similar kind; and after two or three such attacks they began to have fever and ague, *i.e.* in the soldier's language, a fever characterised by a distinct cold stage. From this time the fever and ague would recur, in some cases daily, in others, every other day, in others again, at irregular intervals.

It is impossible to say in what form the Cyprus malarial fever would have been seen most frequently if it had been left to itself after the arrival of the invalids at Netley. As a matter of fact, irregular single attacks were those of most common occurrence, but it can scarcely be doubted that the prompt administration of quinine in efficient doses prevented the development of the regular types of quotidian and tertian ague. These attacks were never immediately dangerous unless when complicated with some serious pre-existing visceral lesion. It was far otherwise, however, with the fevers that assumed the remittent form. These were often extremely dangerous, and quinine appeared not

to have the control over them that it had over the purely intermittent forms.

The influence of cold in developing ague or in bringing on a recurrence of it, was well seen in these invalids. It will be remembered that they, for the most part, arrived in England in the depth of an unusually cold winter. Many of them who had been free from ague for weeks said that the paroxysms returned as they approached the English Channel; and on their arrival at Netley a certain number of each party were always found to be suffering from ague, usually in the cold stage, brought on no doubt by the cold of the journey from Portsmouth. In addition to this, every considerable sudden fall of temperature was pretty certain to be followed by an increased number of attacks, and I have no doubt that the frequency of the relapses, and the severity of the symptoms that was witnessed in some of these invalids after their arrival at Netley, were in great measure due to the intensity of the cold during the almost Siberian winter of 1878-79.

Local Complications.—The spleen was enlarged in almost every case, but it was not observed that the severity or the frequency of the paroxysms bore any definite relation to the amount of enlargement, or to the tenderness of the organ; nor was there any correspondence between its size and its tenderness.

My impression was that when the spleen became seriously painful, this was not due to the mere mechanical stretching of its capsule, but rather to inflammation of it, and to the extension of this process to the contiguous peritoneal surface of the diaphragm or abdominal wall.

Liver.—Congestion and enlargement of the liver were also very constantly observed. In nearly every instance when the attacks of fever had been numerous, this organ was found more or less enlarged; but I need scarcely say that whenever an increase in the size of the liver has become perceptible to physical examination, it must have already attained a considerable degree. The average weight of a normal liver being between 50 and 60 ounces, it is scarcely possible by the most skilful examination to demonstrate an increase of, say, two ounces. Hence the minor degrees of hepatic enlargement must frequently pass unnoticed, and the early stages of congestion, both of the liver and the spleen, must be the subject of inference rather than of direct observation and measurement.

Anæmia.—This was a well marked condition in nearly all, if not in all the Cyprus invalids. It showed itself not only in the blanched skin, the pearly conjunctivæ and pallid mucous membranes, but also in a notable diminution in the relative proportion of the red corpuscles of the blood in nearly all the cases when this fluid was examined microscopically. The peculiar aspect of these invalids, as compared with those from Malta and Gibraltar only, was caused, however, not by mere pallor, but by a dusky discoloration and pigmentation of the skin, which in some instances existed in such a marked degree as to remind one of the so called bronzing that is seen in Addison's disease.

Purpura.—Before the invalids arrived at Netley, there was a very general impression that they had suffered considerably from scurvy in Cyprus. I therefore searched carefully for examples of this disease, but was unable to find any. On the other hand I saw more than one case of purpura. It may be objected that the distinction between these two affections is not easily made, but if we accept the conclusion that scurvy is a cachectic condition of the blood and tissues induced by want of fresh vegetable juices in the food, and which is readily cured, when these are supplied, it may then be safely asserted that the condition observed among some of the Cyprus invalids was not scurvy; for the men in whom it was most conspicuous assured me that they used to eat grapes abundantly in Cyprus, to the extent of a pound or more per diem, in addition to their vegetable ration, which, it must be remembered, was not always defective. The purpuric symptoms were chiefly pimple blotches on the lower extremities, and epistaxis, with a certain degree of sponginess of the gums; but there were neither the ulcerations, nor the œdematous effusions and dyspnoea, which are so common in scurvy.

Bronchitis.—This complication was witnessed in a very considerable number of the cases, but owing to the inclemency of the season, which rendered bronchial catarrhs extremely common, even among those who had not been out of England, it was not easy to determine how far the cold or the recurrence of ague

was concerned in its production. It was quite remarkable, however, to what an extent a paroxysm of ague would aggravate an attack of bronchitis, and even induce pulmonary congestion with sanguineous sputa. Still, it was seldom that actual pneumonia was developed.

Renal Disorders.—The connection between malarial infection and Bright's disease appeared evident in one or two instances, and the minor forms of renal congestion were comparatively common.

Ascites and General Dropsy.—These conditions sometimes existed without any disorder of the heart or kidneys, and without any manifest cirrhosis of the liver. Such cases may have been due to hydræmia, but not to mere anæmia, because those in which ascites occurred were not more anæmic than others in which there was no such effusion. In all the cases in which dropsy occurred the liver and spleen were enlarged, but not more so than in other cases when there was no dropsy. Most frequently the effusion only amounted to a slight subcutaneous œdema, but in three patients the accumulation of fluid in the peritoneal cavity was very large. These, however, made good recoveries without any operative interference, and it seemed that when such ascites or anasarca was not dependent on manifest renal disease it was entirely free from danger.

Cerebral disorder.—In some of the worst cases there were headache, stupor, delirium, convulsions, coma, and coma vigil in various degrees and combinations.

Rheumatism.—This complication was rather frequent in certain of the cases, but as it did not occur in any of the invalids who had not been stationed in Malta and Gibraltar, I shall reserve for the present what I have to say concerning it.

Dysentery.—This complication was comparatively rare, but when it occurred it was extremely intractable, and in two cases it proved fatal.

Mortality. In addition to these two fatal cases there were three other deaths from fever; and this, which is a correct statement of the deaths that took place in the Medical Division, represents, I believe, the entire mortality from fever amongst the invalids who arrived at Netley either directly or indirectly from Cyprus.

General Outline of the Treatment adopted for the Cyprus Fevers.

The efficacy of quinine in arresting the paroxysms in the great majority of the cases was extremely well marked. The general directions for its administration were that it should be given in single large doses rather than in repeated small ones. A dose of about 20 grains was that most frequently prescribed, but in some of the worst cases this was repeated until 40 or 50 grains were taken within 24 hours. The hypodermic injection of the neutral sulphate was not had recourse to, chiefly in consequence of the frequency with which this method of using quinine has been found to cause tetanus. Quinine made into pills according to the formula recommended by Mr. H. P. Reynolds, of New York, usually answered admirably. The method is as follows: $\mathfrak{z}$ Quinæ sulphatis, gr. 600; acid, tartaric, gr. 100; glycerinæ, m. 75. Rub the quinine and acid together till the crystals disappear, then add the glycerine, and continue the trituration until a mass forms. The pills made in this way keep perfectly, and quinine so administered is just as efficacious as when given in solution with sulphuric acid. In numerous instances the solution of hydrobromic acid, recommended by Dr. Milner Fothergill, was given with the quinine instead of any other acid, especially in cases where the effects of quinine upon the nervous system were complained of; but when doses of 20 grains and upwards were given, the relief afforded by the acid was rather uncertain, and bromide of potassium, in doses of from 10 to 20 grains, given two or three hours after the quinine, was found much more effectual. When it acts favourably, the bromide causes sleep, and the patient on awakening finds his fever diminished, if not gone, and his head free from the distressing noises and other unpleasant sensations which quinine so frequently occasions.

Warburg's Tincture.—In some cases where quinine failed to arrest the fever, this remedy was used with good effect. When quinine acts favourably it nearly always causes free perspiration, and when it fails, such perspiration does not occur. These are the cases, as far as I can judge, in which Warburg's tincture is of the greatest service, but it is also of use when quinine causes gastric irritation and a dry tongue. The remedy would doubtless be prescribed much more frequently than it is if it were not for its cost. Arsenic was frequently tried, but it was very far inferior to quinine for arresting the paroxysms.

It has not been considered necessary to burden this narrative with a detail of the simpler cases, but the following account of two of the more serious cases that came direct from Cyprus, and in which the fever was of the remittent form, may perhaps not be uninteresting.

CASE I.—Remittent Fever. Enlarged Liver and Spleen. Relapse. Bronchitis. Cerebral symptoms. Recovery.

Patient's Statement and previous History.—No. 664, Lance-corporal R. J., æt. 26, 42nd Regiment, was in excellent health when he landed in Cyprus in July 1878. About the middle of September he began to suffer from fever, with headache, giddiness, pain in the back, vomiting, and diarrhoea. At this time he used to have chills followed by heat and sweating, "but not so severe as in ague." He struggled against the disease, and his comrades used frequently to see him, even when on duty, turn aside to vomit. Eventually he was obliged to go to hospital through extreme weakness. Early in October he began to have pain in his liver, which continued off and on, so that he remained in hospital until he was invalided. A few days before reaching Portsmouth he caught cold, and had an attack of bronchitis.

State on Admission, and Progress at Netley.—He was admitted at Netley on the 28th of November 1878, extremely weak, emaciated, sallow, almost jaundiced. He had bronchial catarrh on both sides, but not severe. Both liver and spleen were enlarged and tender, the liver dulness extending, in the right nipple line, downwards for 6 inches from the fourth costal interspace.

Treatment.—Chloride of ammonium with quinine occasionally in 15 grain doses, and nitro-muriatic acid compresses over the hypochondria. On the 20th of December he had much improved; his cough had almost ceased; he had no pain in the hepatic region; his temperature was 98·4; and he was able to sit up a few hours every day. On Christmas day he had what seemed to be an attack of ague and a return of pain in the splenic region. For this he was ordered 20 grains of quinine, to be taken when the sweating stage set in.

26th December. He took the quinine this morning during an imperfect remission. Was ordered a bottle of Warburg's tincture.

27th. Much the same. Warburg's tincture repeated.

28th. Is giddy and sleepless, but no better. To have 25 grains of quinine.

29th. Bowels sluggish; fever continues with a recurrence of bronchial catarrh. To have 5 grains of calomel, and 25 grains of quinine when the bowels move.

Evening. He is frequently delirious, sleepless, and uneasy; skin dry; tongue thickly furred; cough troublesome. To have 20 minims of liquor morphiae in draught, and 40 grains of quinine by enema.

30th. He has had very little sleep, low delirium constant. 12 grains of quinine to-day, and morphia draught at night.

31st. As before. Repeat quinine, 12 grains; and he is to have a draught of bromide of potassium and chloral at night.

1st January 1879. He slept a little after the draught, but he is no better; his tongue is dry, fissured, and cracked; he takes scarcely any nourishment; his delirium is constant, and he is at times insensible. There is nothing in the condition of his chest or abdomen to account for his symptoms; his cough, however continues. Head to be shaved and blistered, and he is to have ether and ammonia.

2nd. To-day he is unconscious.

3rd. He lies helpless on his back; he is delirious, and there is subaltus tendinum; he said last night that his neck was broken.

4th. Had no sleep last night, but perspired most profusely, drenching his bedclothes, which had to be changed at 6 a.m. He is now to have 20 grains of quinine and a draught of morphia and ether.

Evening. Has been perspiring all day, and sleeping occasionally. To have 20 grains of quinine, followed by 20 grains of bromide of potassium.

5th. He is quite rational this morning; his cough is rather more troublesome, and sibilus and rhonchus are general over both lungs, but there is no dulness on percussion; he is somewhat deaf from quinine.

6th. He relapsed into stupor last night, but perspired freely, and is better again this morning. Urine scanty, but free from albumen. Ether and ammonia mixture without quinine.

7th. Still occasionally delirious. Blister to back of neck. Quinine, 3j, internally.

8th. Free from delirium. Cough troublesome; the sputum, which hitherto has been white and frothy, is now thicker and yellowish green.

10th. Less cough. Profuse perspiration at night. 20 grains of quinine.

11th. Decidedly better. From this time he continued to improve, but his weakness was so great that he was unable to leave his bed until the 28th of January; of course during this serious illness he was most carefully nursed, and his strength was supported by appropriate diet and wine.

On opposite page is shown his temperature chart from the 29th of December 1878 to the middle of January 1879.

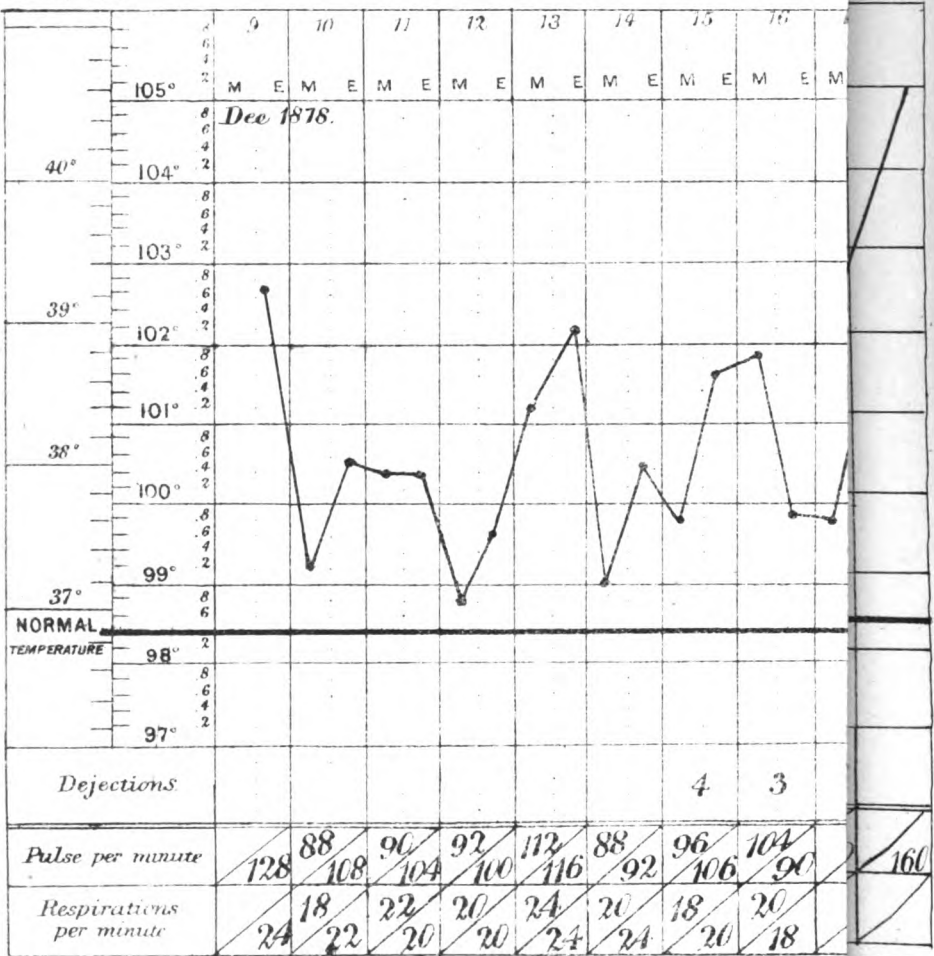
Remarks.—This case was regarded as one of pernicious remittent fever. There was no sign of any local inflammation sufficiently intense to account for the symptoms. There was no pneumonia, no nephritis, nor any such indications of hepatitis or splenitis as are usually observed in these affections. Both the liver and spleen increased in size during and after this attack, but especially the liver, which remained enlarged up to the date of his discharge from the service on the 7th of April 1879. I should mention that he had a relapse with similar but less severe symptoms, and of shorter duration, in the middle of February.

CASE II.—Fever. Ague. Diarrhœa. Stupor. Death.

Patient's Statement and previous History.—No. 1883, Private R. K., æt. 24, A.S.C., was in good health when he landed in Cyprus in July 1878, but very shortly after his arrival suffered from cramps in the abdomen, without vomiting or purging, for which he was in hospital three days. At the end of a fortnight he had another attack of cramps in the belly, accompanied with vomiting and pain in his head and shoulders, but without rigors. For this he was in hospital 15 days. After the lapse of another fortnight he had a third attack, and was in hospital 14 days. At the end of a week he had a fourth attack, and when he was becoming convalescent he was seized with ague, which recurred every other day for 10 days. He was then invalided, and he had several paroxysms of ague on the voyage home.

State on Arrival and Progress at Netley.—He was admitted at Netley on the 28th of November 1878 in a very weak state; and between that date and the 9th of December he had two paroxysms of ague. He also had a troublesome diarrhœa. From the 10th to the 15th of December the diarrhœa persisted notwithstanding the use of active astringents and of quinine in doses of 10 grains and upwards. About Christmas he appeared to be improving, but, afterwards, his temperature began to rise daily, and on the 2nd of January 1879, the diarrhœa returned with vomiting. The stools were semi-fluid and ochrey, and it was observed that his liver had become enlarged and tender. He was ordered quinine in a 25 grain dose, and it was repeated on the following day. On the 4th of January his bowels were moved seven times. On the 5th he became unconscious, and during this day he had a convulsion, which was followed by profuse sweating. On the 6th he seemed better, but during the night he again became unconscious. His urine and motions were passed involuntarily, and the diarrhœa was persistent and uncontrollable. On the

Case II.



evening of the 9th his temperature rose to 107·2, his pulse to 160, and he died during the night. The chart of his temperature, &c. is annexed.

Remarks.—In this case, owing to the persistent diarrhoea, and the character of the evacuations, it was thought there was ulceration of the intestine, especially as the administration of quinine was followed by increase of diarrhoea as well as by insensibility and convulsion. The quinine was therefore suspended between the 4th and 7th of January, and ipecacuanha with bromide of potassium was given instead. On the 8th, quinine was again tried, but its use was followed by increase of diarrhoea without any diminution of the fever.

ABSTRACT OF POST MORTEM Examination.*

Brain.—Membranes congested. Cerebral vessels full of blood. Considerable injection of velum and choroid plexus. Brain substance normal.

Lungs.—Crepitant throughout; engorged, but otherwise normal.

Heart.—Surface loaded with fat. Muscle soft. Valves healthy.

Liver.—Measurements 11" × 3½" × 9". Capsule smooth and transparent. Section, pale, owing to fatty degeneration. Acini very indistinct.

Spleen.—Weight 16½ ounces. Structure apparently normal. Pulp soft; capsule lax.

Small Intestine.—Anæmic, but otherwise healthy.

Large Intestine.—Nothing abnormal on external or internal surface.

II.—REVIEW OF CASES FROM MALTA AND GIBRALTAR ONLY.

I must now refer to my previous remark that rheumatism was not witnessed among any of the patients who had not previously been stationed either in Malta or Gibraltar, or had not been quartered at the latter place before returning to England. That invalids from hot stations like Cyprus, Malta, and Gibraltar, suffering from malarial fever, should occasionally have attacks of rheumatism on returning to England in winter, would not perhaps be deemed very surprising. Nevertheless, it is a remarkable circumstance, that among the 35 invalids furnished by the detachments that went out direct from England to Cyprus not one suffered in this way, whereas among the 86 who had previously been stationed in Malta, and who came home direct from Cyprus, the rheumatic affections occurred in about five per cent.; and among those who were quartered in Malta before, and in Gibraltar after their service in Cyprus, their occurrence was in the proportion of about 25 per cent. This fact is all the more striking, because the invalids who come to Netley from other hot countries, *e.g.*, India, China, Ceylon, Mauritius, and the West Indies, and who have there suffered from malarial fever have not heretofore been observed to furnish an unusual proportion of cases of rheumatism. It would, therefore, seem probable that there was some special cause in operation to give rise to such an excess of rheumatic cases among the Cyprus invalids who had been stationed previously in Malta and subsequently in Gibraltar; and this probability is strengthened by the circumstance that, every year, a considerable number of the invalids who come from these two stations present symptoms very similar to those that were observed among the invalids just mentioned. But these are not cases of ordinary rheumatism. The rheumatic symptoms constitute only a portion of the morbid condition to which I am referring, a condition which has a very distinct entity of its own, but which has hitherto received so little attention, except from military and naval medical officers, that it has neither name nor place in our official nosology.

I myself have not seen the disease in question, *viz.*, the "Malta fever," or the "Rock fever," in the Mediterranean, but as far as I have been able to gather from the statements of those who have suffered from it (and some of my informants have been medical officers), the following is an outline of its commencement:—

The disease appears to begin most frequently in spring or summer. For example, out of 51 cases, one began in January; four in February; six in March; nine in April; eight in May; nine in June; ten in July; two in August; one in October; and one in November.

Its commencement may occasionally have some resemblance to mild quotidian ague, but more frequently the invasion is so insidious that the patient is unable to mention the day on which his illness began. He usually first complains of a feeling of lassitude and drowsiness, with slight headache and loss

* Conducted by Dr. Boileau, Assistant Professor of Pathology.

of appetite. After a few days he perhaps thinks he is bilious; he has nausea, sometimes even vomiting, and his bowels are either costive or too loose. He seldom has rigors at this stage, but he is chilly and feverish, and he feels that his illness is increasing day by day. His headache grows worse and affects his forehead especially; his lassitude and debility become so great that he ceases to take an interest in anything; he loses his appetite altogether; and throughout the whole day and night he remains hot, thirsty, ill, and desponding. If the case is a mild one these symptoms decline after a variable period, rarely less than a week, more frequently extending to two or three, and the patient fancies himself convalescent. Sometimes he leaves hospital and goes to his duty, but after a day or two he finds his old symptoms coming on again, his nausea or vomiting returns, with loss of appetite and irregularity in the action of the bowels. Very frequently he now suffers from one or two attacks of diarrhoea, and occasionally this assumes a dysenteric character, being attended with much tenesmus and the passage of mucus more or less tinged with blood. Sometimes he thinks he catches cold, for he begins to cough, and has flying pains about the chest; and after a time it may be observed that his sputum is tinged with blood, or he may be seized, sometimes very suddenly, with a pain in his back or in one of his limbs, and this pain holds him as if in a vice, it is so severe. During all this time he has been losing flesh steadily; he has now become very anæmic; his hair falls out; his spleen, and sometimes his liver also, become enlarged and painful; and it is usually at this stage that, if a soldier, he is invalided and sent to England.

If the case is a severe one, many or all of the preceding symptoms are aggravated. The headache becomes so intense as to be scarcely endurable; the drowsiness merges into stupor and low muttering delirium; the prostration is extreme; the lungs become greatly congested, and easily take on a low form of inflammation; there may be epistaxis, or hæmoptysis, sometimes very severe; or there may be exhausting diarrhoea with occasional discharges of blood, either black or bright red; the pain in the limbs may develop into very decided rheumatism, with effusion into the joints, endocarditis, or other complications, and death may ensue at almost any period.

When such patients reach Netley they present a very variable appearance. Their convalescence, which had begun before they left the Mediterranean, may be continuous. Although somewhat thin, weak, and anæmic, they may rapidly put on flesh and regain colour and strength, being reminded of their recent ailment only by occasional twinges of pain in the back or limbs, by being unduly sensitive to cold, and by having a tendency to free perspirations at night. More frequently, however, the period of apparent convalescence is only delusive. With the change to a colder climate the patient experiences not an increase of vigour but a recurrence of rheumatism more or less severe, affecting sometimes the joints, sometimes the fibrous structures and aponeuroses, or he is seized with a severe bronchial catarrh which may easily pass into capillary bronchitis or, more rarely, into congestion and inflammation of the lung tissue. Nearly always there is an increase in the size of the spleen; and, sooner or later, signs of inflammation of the organ, or again, he may have, either alone or in any combination, a recurrence of cerebral symptoms, such as despondency, irritability, a readiness to shed tears, a loss of virility, insomnia, anæsthesia, or hyperæsthesia. He may have dyspepsia, palpitation, pleurisy, epididymitis, or orchitis, together or in succession. He nearly always has fever, with evening exacerbations and morning remissions, and during the night or towards morning he perspires most profusely. Such perspirations, however, bring no relief to his sufferings. His pains, his bronchial catarrh, and other symptoms pursue their own course, and after a time seem to wear themselves out. Then the patient enters on another period of convalescence of indefinite duration and degree. Like the first it may be progressive and complete; or, after it has reached a certain stage, the pains may recur, and in a few days or weeks the patient may be as bad as ever.

Another strange feature of this disease is the occasional absence of any manifest local disorder, except, perhaps, enlargement of the spleen. The patient will say he feels pretty well, that he has a good appetite, and that if it were not for his night sweats, tremulousness, and weakness, he would be as well as he ever was. Still, he may have a temperature oscillating from about 93° in the morning to 102° or 103° at night. Indeed, it is not uncommon to have

these patients declare they are better when their temperature varies in this way than when its daily range is less, especially if the reduction has been induced by quinine.

Consideration of Symptoms in detail.

Digestive System.—The symptoms of gastric and intestinal catarrh manifest themselves at an early stage, and persist more or less to the end. The tongue in the secondary stage is nearly always more or less coated in the middle, and red at the tip and edges. This is so constant a sign that I never consider a man free from the tendency to relapses as long as it remains. The gums are often spongy, and bleed readily. Sometimes they are raw, sore, and slightly ulcerated. The pharynx is often congested, and occasionally affected with aphthæ, or even with ulcers, which may spread upwards to the nares, or downwards to the epiglottis and larynx. There is generally some uneasiness at the stomach, with a feeling of nausea after food; but vomiting does not often occur except in the early stage of a relapse. The appetite remains wonderfully good, and I believe that the safety of the patient and his ultimate recovery are due to this circumstance. He may not be able to assimilate all the food that he takes, but as long as he can eat heartily, he seems to suffer comparatively little from the persistent fever; and this would appear to lend support to the opinion that during the remissions he makes good the loss which he sustains during the pyrexial accessions. The bowels are seldom regular. There is sometimes costiveness, at others diarrhœa; and the evacuations are occasionally mucous and blood-streaked, but without the dysenteric odour. The fæces are usually well coloured, and almost never similar to those seen in enteric fever. The abdomen is frequently somewhat tympanitic and tender on pressure, but the pain is oftener towards the left hypochondrium or in the neighbourhood of the umbilicus than elsewhere.

The spleen is nearly always enlarged, and pressure over it causes pain even when the patient asserts that he is quite well. Its capsule often inflames and becomes adherent to the diaphragm, liver, or other adjacent parts, and this, I believe, is not infrequently the starting point of the peritonitis that sometimes occurs in these cases.

The liver is also frequently enlarged and tender on pressure, but, as I have previously remarked, the minor degrees of enlargement of this organ are not easily demonstrated. It is seldom, however, that there is as much pain in the right hypochondrium as in the left, and as far as my present observation goes inflammation of its capsule is less common than that of the spleen. I am as yet unable to state the exact anatomical conditions of the spleen and liver, but in some of the fatal cases sections of these organs have presented a pigmented appearance to the naked eye.

Disorders of the Locomotory System.—The rheumatic disorders rarely, if ever, occur at the outset of the disease. Some few patients have said that their disease began with pains in the limbs; but nearly always on close examination it has been found that there was an antecedent period of malaise and impaired health. There is no constancy of the order in which the joints are affected. Sometimes the small joints of the hand or foot suffer first, and in such cases they look as if they were affected by gout. At other times the large joints are attacked, especially the knees and hips, which become exquisitely tender, not merely from the amount of effusion, which is not often considerable, but from hyperæsthesia of the integument.

The intervertebral joints are very frequently affected, especially those of the lumbar region, but the most painful of all are the sacroiliac synchondroses. In such cases the patient dreads every movement, and he will lie for days in one position, risking the formation of bed sores, and resisting the desire to evacuate his bowels rather than he will encounter the suffering that a movement will entail. Oftentimes the tendo Achillis and the fibrous structures around the ankle joint are involved; but, perhaps the lumbar aponeurosis and the sheaths of the nerves issuing from the sacral plexus are still more commonly affected, and the pain runs down the back of the thigh, or radiates to its anterior surface. Occasionally, as in gout, the bursæ over the patellæ fill with fluid, and become painful; but more frequently, painful node-like swellings form on the ribs or on their cartilages, or even on the sternum itself, and these have been ob-

served in patients who had not presented a sign of syphilis either congenital or acquired.

Genito Urinary System.—Closely allied to these disorders must be considered the inflammation, or neuralgia of the testicle, which occurs in about 15 per cent. of the cases. The epididymis is the part most frequently affected, but occasionally the body of the testicle is involved. As a general rule the inflammation, or neuralgia, as the case may be, subsides spontaneously after a time, and is often only aggravated by active treatment. The lymphatic glands of the groin are seldom involved. Throughout the whole course of the disease the reproductive function remains singularly quiescent.

It may also here be mentioned that the urine seldom differs from that of other febrile cases, and it rarely contains albumen.

Diseases of the Integumentary System.—It is seldom that the patient has the sallow, semi-jaundiced, pigmented complexion that one sees in the subjects of intermittent fever. He is pale, it is true, but his pallor resembles that of a man who has had enteric fever; the face is sometimes suffused and slightly puffy, more frequently it has a moist greasy look. Cutaneous eruptions are not uncommon in the secondary stage, such as sudamina and erythema simplex, but eczema, lichen, and erythema nodosum are also occasionally seen. Many patients, however, complain of a pricking or tingling sensation in the face, forehead, or hands, when there is nothing visible beyond the slight puffiness just referred to.

The hair falls out in nearly every case, usually during the secondary stage, when the rheumatoid pains and swellings are at their acme. When it begins to grow vigorously again, it is often, but by no means always, an indication that the disease is at an end.

Disorders of the Nervous System.—It has been already stated that in the early stage of the disease there is marked depression of spirits with a tendency to drowsiness and stupor. In the secondary stage the enfeeblement of the nervous system becomes more conspicuous; there is frequently loss of memory, irritability of temper, melancholy foreboding, sleeplessness, a proneness to shed tears without any adequate occasion, and an unsteady, timorous, sometimes childish manner. The tremulousness is sometimes so great that the patient is unable to write or to carry a glass of water to his lips without spilling a portion of it. More rarely one may observe an unreadiness of speech, or aphonia, or a temporary loss of sensation or motion in the extremities; but hitherto I have seldom seen any defect of vision, hearing, smell, or taste. These deviations from the normal state exist in various degrees; sometimes one sometimes another condition assumes a special pre-eminence, and the medical attendant must be careful not to mistake the mental aberrations, the aphonia, anæsthesia, hyperæsthesia, &c. for systems indicative of permanent lesions of the brain or spinal cord.

Disorders of the Respiratory System.—The tendency to catarrhal affections of the bronchi and to pulmonary apoplexy is very general, and in many instances the apices of the lungs are the parts chiefly involved. The severity of the cough and the quantity of sputum are frequently out of all proportion to the auscultatory signs; these generally are indicative of bronchitis—sibilant, rhonchal, and mucous râles, being those most frequently heard—with some harshness of the inspiratory murmur and prolongation of expiration. Sometimes the percussion note is slightly altered, and one perceives a diminished resonance, with such a degree of harshness of the respiratory murmur as to amount almost to tubular breathing. One is then apt to conclude that the patient is in the early stage of phthisis. Occasionally this localised pneumonia co-exists with pleurisy and adhesion between the costal and pulmonary pleuræ at the apex. But there are other cases in which the lower and posterior parts of the lungs are most affected, and, not infrequently, there is a certain amount of pleurisy with effusion on the left side. The dyspnoea and the amount of blood in the sputa are generally out of proportion to the other signs, and are probably due more to the depraved state of the blood and the malnutrition of the capillaries than to structural impairments of a permanent character. In some instances, however, the pulmonary mischief is lasting; the inflammation assumes a chronic form, with or without hæmoptysis and chronic pneumonic phthisis is developed.

Disorders of the Circulatory System.—Of these, palpitation is by far the most common. With a small amount of unusual exercise, and even under the

influence of trifling emotion, the heart beats with exaggerated rapidity, and fugitive systolic murmurs become audible. Such murmurs, when not "hæmic," are generally due, no doubt, to irregular action of the papillary muscles, but sometimes they are the expression of endocarditis, and are connected with structural alterations in the valves.

Disorders of the Blood and Blood Vessels.—Purpura often complicates this disease, and epistaxis, hæmoptysis, and bleeding from the gums are tolerably common. Occasionally, as a result, it may be presumed, of the altered condition of the blood and capillaries, sanious, or grumous collections form in the subcutaneous connective tissue, and are attended with much pain and constitutional irritation. If they are opened by the knife, profuse bleeding is apt to ensue, a capillary and venous oozing, as intractable as that which occurs in persons of the hæmorrhagic diathesis. To the naked eye the blood looks pale and watery, and it does not coagulate like healthy blood. Under the microscope the red corpuscles appear of the normal size, but they do not form rouleaux so readily or uniformly as in the healthy state. The white corpuscles are found in some excess, but the principal change that I have hitherto observed is in the elementary granules, nuclei, or homococci, as these particles have been sometimes called. In some cases, especially during the height of the fever, the serum areas contain an unusually large quantity of this granular and molecular matter; but I have never been able to satisfy myself of the presence of bacteria in them. It is true that certain of the molecules under magnifying powers of from 600 to 1,200 diameters closely resemble the bodies that have been described as spherical bacteria, being of nearly uniform size, circular, or rather globular in shape, and refracting the light strongly, but up to the present time I have not even anything to prove that they are essentially different from the similar particles that may be found at times in the blood of perfectly healthy persons.

Disorders of Calorification.—The range of body temperature during the pyrexial periods of the secondary stage usually presents the remittent form. In the early morning and forenoon the temperature in the axilla and under the tongue is most frequently somewhere between 97° and 102° Fahr., but in the afternoon it rises more or less, generally from two to four degrees, and continues high until midnight, or perhaps a little later, when defervescence sets in with perspiration. This, I believe, is the general rule, and I have verified it on many occasions. Sometimes, however, especially in bad cases, the oscillations are more irregular, and there may be two or three exacerbations and remissions in the course of 24 hours.

During the apyrexial periods the range of body temperature may be only slightly in excess of what is normal; it is seldom, however, that it becomes quite normal in the evening. At that time, if the examination is made with sufficient care a slight rise may often be discovered even when the patient professes himself to be quite unconscious of it, and when the morning observations show nothing unusual.

Duration of the Disease.—I am unable to state anything definite regarding the duration either of the primary or of the secondary stage, or of the pyrexial or apyrexial periods of the latter. In our anxiety to arrest the disease or to modify its local manifestations we nearly always adopt measures that obscure its natural evolution, and what this may be will only be determined when both patients and their medical attendants shall have the courage and the faith to observe whilst not interfering with it. Still, it is a disease the duration of which, with its sequelæ, is to be counted in months rather than in days or weeks, and I have known it to last nearly two years.

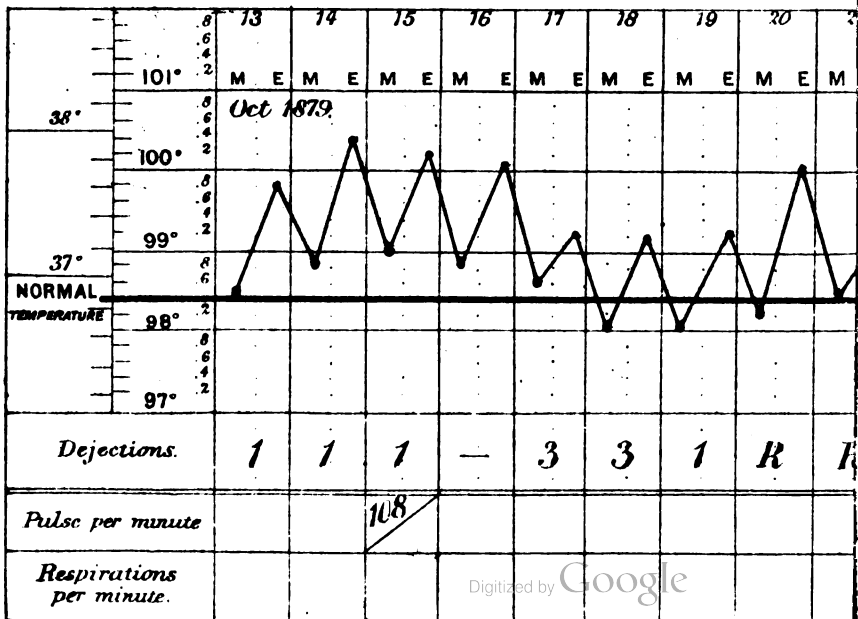
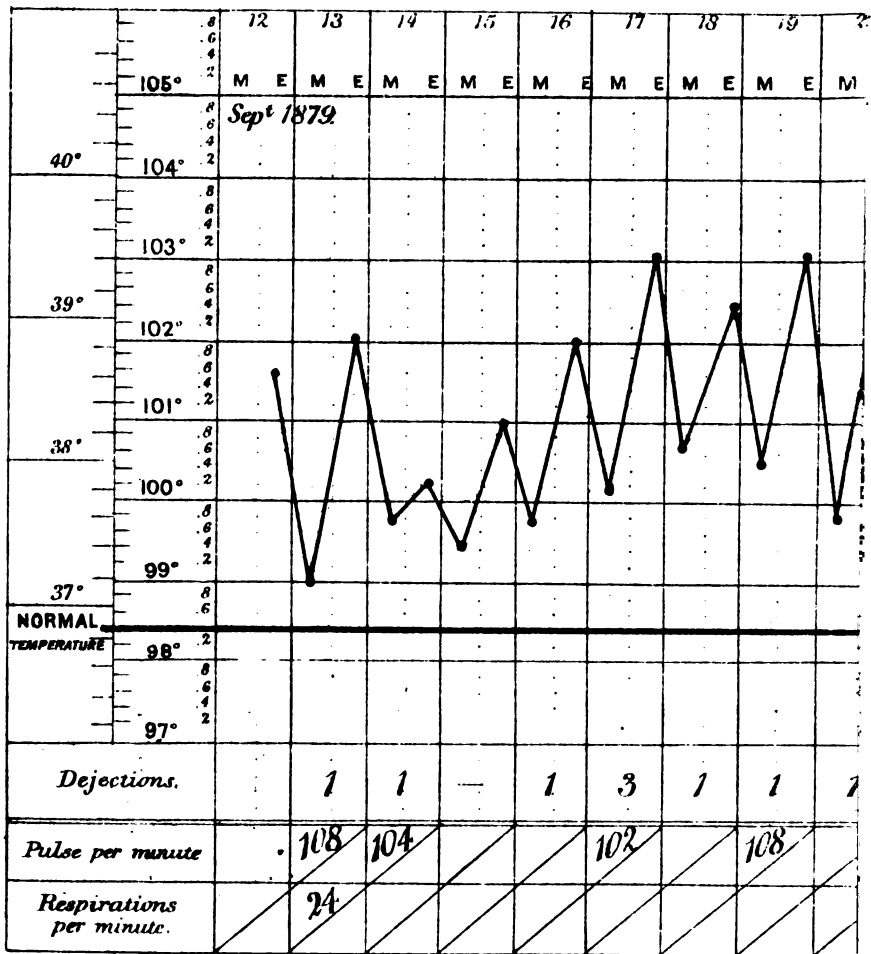
Is it a specific fever?—To those who have not seen many cases of the disease it may seem almost impossible for a fever of such indefinite course and duration to be idiopathic. But that the pyrexia is not due to any special and local inflammation is evident from the fact that it nearly always precedes and often exists independently of any such condition. In some cases there is no pulmonary complication; in others there are no rheumatic symptoms; in others again there is no perceptible enlargement of the liver or spleen; nor as far as can be ascertained is there any hepatitis or splenitis. Moreover, the intensity of the fever bears no relation to any such condition; nor, in fact, does the fever resemble that of hepatitis, splenitis, or bronchitis, as observed in the invalids

who come from the West Indies, China, Ceylon, or any other hot country. Finally, none of the local disorders, when they have a different origin or an independent existence, present the *sum* of the symptoms that characterises this fever, viz., the insidious access, the frequent and irregular recurrences, the protracted duration, the persistent night sweats, the nervous symptoms, the loss of hair, the hæmorrhagic tendency, the swelling of the testes, the node-like swelling of the periosteum and perichondrium, the tendency to affect the lungs, the cytogenic organs and the joints, and the resistance to all the remedies hitherto tried.

Mortality.—The immediate mortality of the disease is certainly not large. Danger, however, is to be apprehended whenever the body temperature is continuously high, and indirectly from such complications as hæmoptysis, catarrhal pneumonia and endocarditis. I have also seen death to result from large bed sores in one case.

Etiology.—Some writers are of opinion that this fever is of fæcal origin when it occurs at Malta, in support of which they have pointed to the insanitary condition of Valetta, the porous nature of the soil and rock, their saturation with filth of all kinds, and the contamination of the tideless waters of the harbour by similar causes; but, as Gibraltar produces the same kind of disease, it is evident that all the conditions, which are not alike in the two stations, may be eliminated. The soil and rock of Gibraltar, however, are said to be likewise fully saturated with filth; but, on the other hand, it may be well to remember that the insanitary conditions of Malta and Gibraltar are trifling in comparison with those of Constantinople, Smyrna, and Beyrout, or even with those of some of the Greek and Italian maritime towns. The fæcal element is surely not peculiar to Malta and Gibraltar. Nor, indeed, is the malarial element. This is always ready to hand on the Mediterranean shores. *A priori* then, it would seem probable that if this fever were the product of filth alone, or even of filth in conjunction with malaria, it would not be peculiar to Malta and Gibraltar. Is it so, as a matter of fact? On this point I have been unable hitherto to obtain much light by historical references. Still, there are two very remarkable passages in the "Epidemics" of Hippocrates, which, making allowance for the difference between his modes of thought and expression and those of our time, might almost pass for a brief description of the disease. In the few published writings of the older medical officers of the army and navy it does not appear that the primary fever of this disease was distinguished from the malarial remittent or continued fevers; and it was only after the Crimean War that the distinction began to be made. During the last 20 years, however, not only has this been done with increasing frequency, but the connexion between the primary fever and its sequelæ has been more and more clearly seen. In the army, Doctors Marston, Chartres, Boileau, Notter, Oswald Wood, and Professor Maclean have published papers regarding it; and in the navy it appears to have been equally noticed, although the names of the earliest observers of it in this service are not given in the Naval Medical Reports. In the Naval Medical Report for 1862, Dr. Moxey describes a fever very like it as having occurred whilst his ship was stationed at Baïæ, and he says that, "the relapsing form of the disease always appeared to be greatly aggravated by the use of quinine." Again, in the report for 1872, Staff-Surgeon George Moore, M.D., regarded the disease observed by him as a "modified relapsing fever," and considered that 12 of his cases were contracted at Smyrna, the remainder at Malta; and he also found that quinine possessed "no anti-periodic power whatever in *this* form of fever." If, then, the fever referred to by these and other medical officers of the navy be identical with that which prevails at Malta and Gibraltar, it will at once be obvious that it occurs in some, at least, of the Italian and Syrian maritime towns, and that it may likewise have existed in Cyprus. What then is its cause, and what is its nature? To these questions the answers can as yet be only negative. That it is not our enteric fever appears certain, from the fact that it has neither its clinical form, nor its mortality, nor its specific anatomical lesion; that it is not a malarial fever seems proved by its absolute resistance to quinine, by its protracted duration after removal of the sufferers from a malarial locality, as well as by its different aspect and progress throughout; that it is not relapsing fever may be concluded from the positive

* The works of Hippocrates, translated by Adams. Vol. I., pp. 355 and 359.



facts that it is neither epidemic nor contagious, and that it has a different mode of invasion as well as of evolution, and from the negative fact that no spirilla have hitherto been found in the blood during the periods of relapse; and that it is not dengue, anyone, I think, may satisfy himself by perusing a description of the latter disease. It certainly has very little resemblance to the dengue that I have seen.

Nomenclature.—If then we conclude that it is a specific fever, *sui generis*, it ought to have a name and a place in our official nosology. In the statistical reports it has appeared hitherto under various designations, such as febricula, common continued fever, ague, remittent fever, enteric fever, rheumatism, acute, chronic, or muscular, or even as phthisis, chronic pneumonia, hæmoptysis, bronchitis, hepatitis, or splenitis, according to its most prominent local manifestations, or, perhaps, according to the particular views of the medical officer. It has also received such names as the "Malta fever," the "Rock fever" (when it has prevailed at Gibraltar), the Mediterranean fever, the gastric remittent fever, the typho-malarial fever, &c., &c., but as there are many objections to these names, some of them being manifestly inappropriate, others inadequate, and several "question begging," I would venture to suggest the adoption of some such designation as complex or complicate fever, *febris complicata*, because the attributive adjunct "complicate" states at once the most salient feature of the disease, but implies no theory as to its nature or cause.

Treatment.—It has hitherto been found impossible to arrest the disease by remedies. Quinine has been given in doses varying from 3 to 80 grains per diem, but without any beneficial effect. Indeed, the large doses do more harm than good. Colchicum, with and without saline aperients, also in combination with aconite and quinine; arsenic, turpentine, salicylic acid, the hyposulphites, and many other drugs have been tried as freely as seemed to be safe, but no reliance can be placed in them either to arrest the fever, or even to diminish the night sweats, or the rheumatoid pains. Carbolic acid has been tried both by the mouth and subcutaneously. In no case did it do any good: in several it did very positive harm when injected under the skin. The solutions of carbolate of ammonia, and of carbolic acid in combination with iodide of potassium, as recommended by Déclat and others, have also been used for hypodermic injection, but without any advantage. When the hæmorrhagic tendency has been a source of danger, the continued use of the tinctura ferri perchloridi has seemed to be beneficial. Ergot and ergotin have, also been of service in arresting hæmorrhage and checking bronchorrhœa when it has been profuse, but neither remedy has any influence in arresting the progress of the disease.

The hypodermic injection of morphia, and the liniments of aconite, opium, and belladonna are useful in relieving the lumbar, sciatic, and articular pains; but blisters appear only to substitute temporarily one pain for another.

The two following cases are examples of the disease as it was observed in patients who had been quartered, one in Gibraltar, the other in Malta, but in no other Mediterranean station. They have been selected, not because they were specially typical, but, because they occurred within the period from the close of 1878 to the end of 1879. Of course they are given as briefly as possible.

CASE III.—A mild case of Fever from Gibraltar, No. 1,889, Private H. J., Aged 24, 2nd Battalion, Rifle Brigade.

Patient's Statement and previous History.—He had good health until July 1879. He was then at Gibraltar, and he began to suffer from fever. He was admitted to hospital on the 27th of the month, and his disease was returned as "febricula." He was invalided for the debility which followed this attack. He says that during his fever he had pain all over, but especially in his head. The headache afterwards became very severe. He never had cough or pain in the chest, but he used to sweat very much at night, and he had pain in his left leg.

State on Admission.—12th Sept. 1879. He is in no pain, but is weak, pale, and wasted. He sweats profusely at night, but is cool by day. His pulse is 108 and regular. The cardiac impulse can neither be seen nor felt. There is a systolic bruit in the mitral area, and the second sound is slightly accentuated. Nothing else abnormal.

Progress of the Case.—16/9/79. Bruit more distinct. Has pain in his head. Night sweats continue.

21st Sept. Says he is quite free from pain.

25th Sept. Has had some epistaxis, and he has a little cough with mucopurulent sputum. Complains of pain in the back of his head. Sleeps badly. Is dispirited. His debility and loss of flesh are more perceptible. He has no appetite. His bowels are loose. He is very thirsty. His tongue is coated, whitish yellow, and dry. Night sweats less profuse.

2nd Oct. Is somewhat better. There is now no bruit in the mitral area, but a systolic murmur is audible in the aortic area. Has no cough. Is free from pain.

4th Oct. Complains of severe pain along the upper and inner part of the right thigh. Hair beginning to fall out.

12th Oct. The pain in his right groin and thigh comes and goes. As a rule he sleeps badly. The first cardiac sound is now only rough at the sternum.

19th Oct. Quite free from pain; improving daily. Up to the 28th of November, when he was discharged to duty, he remained free from any symptoms of relapse. His hair had begun to grow again, and the cardiac sounds were normal. His temperature chart is annexed.

Remarks.—This was an example of the fever without any distinct local manifestations in the lungs, liver, spleen, or joints, but there may have been endocarditis.

CASE IV.—A rather more severe case from Malta, No. 2,517, Private W. McC., Aged 23, A.H.C.

Patient's Statement and previous History.—He went to Malta in February 1875, and had remarkably good health until April 1879. He then began to suffer from fever (*first attack*), which came on gradually, with headache, sleeplessness, loss of appetite, and thirst, but without shivering or diarrhoea. These symptoms lasted about three weeks, and then he appeared to be convalescent, but after a few days he was seized with rigors, diarrhoea, increased headache and fever (*first relapse*). He had no spots on the body, but during this relapse he became delirious, and he was ill for about six weeks. Then he improved in health again for about a fortnight, but at the end of this time he had a *second* relapse, the symptoms being shivering, headache, and insomnia, with pains in the hips, knees, ankles, and elbows, and also with inflammation of the left testicle. The pains continued until the middle of July, when he was invalided home. He arrived at Netley on the 28th of July, and was granted a furlough until the 13th of September. His health improved whilst he was on furlough, but on his return to Netley he fell ill again. He shivered on the 16th of September, and he was admitted to hospital on the 20th of the same month (*third relapse*).

State on Admission.—He was very weak, pale, and wasted. He had no appetite but was very thirsty; his tongue was thickly coated, white, and dry. His bowels were regular. His liver was somewhat enlarged. Spleen only slightly so. Skin, hot and dry by day, perspiring profusely at night. He had a little cough, but no abnormal auscultatory signs. His left testicle was swollen, red, and rather painful.

Progress of the Case.—26th Sept. Is quite free from pain. Has a systolic bruit in the mitral area. Does not sleep well.

27th Sept. Most profuse night sweats. Has no pain. Sleeps very little. Tongue much coated. Pulse slow, 60 to 70. Impulse of apex visible in normal situation. Has no murmur audible at the apex, but in the pulmonary area there is a distinct bruit diastolic in time.

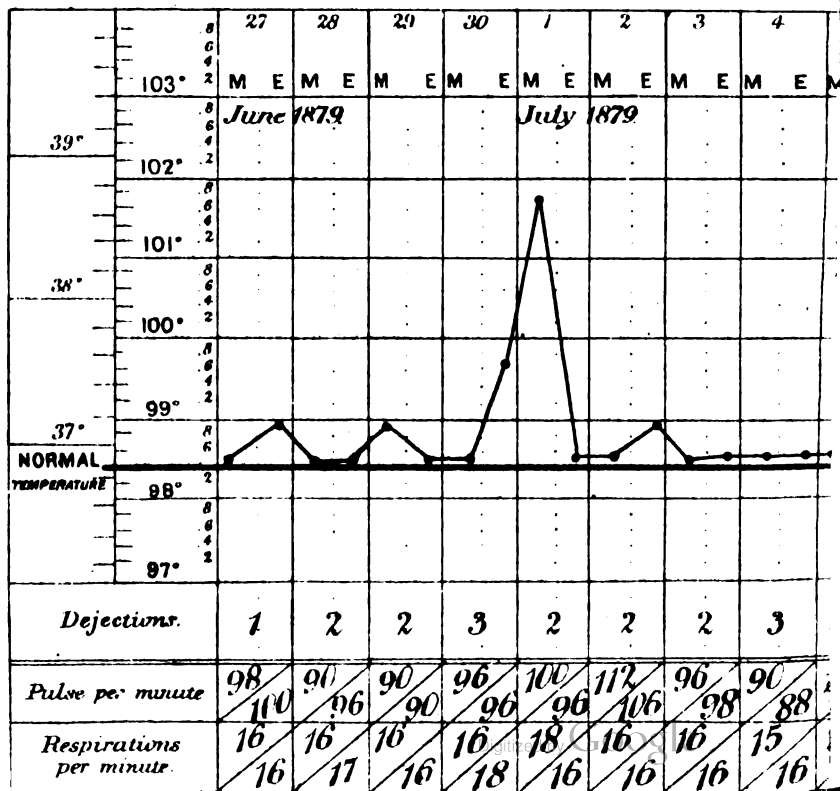
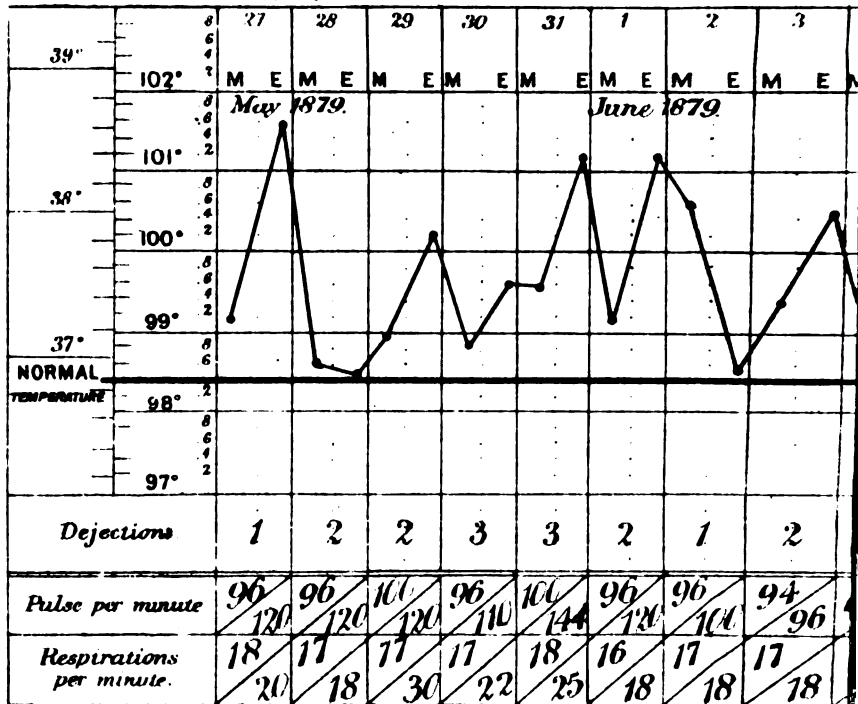
29th Sept. There is no bruit anywhere audible. Sleeps very badly. The perspirations are most profuse.

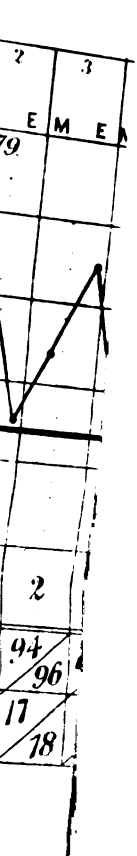
2nd Oct. Cardiac impulse invisible. First sound very feeble. No increase in area of cardiac dulness. Night sweats not quite so profuse.

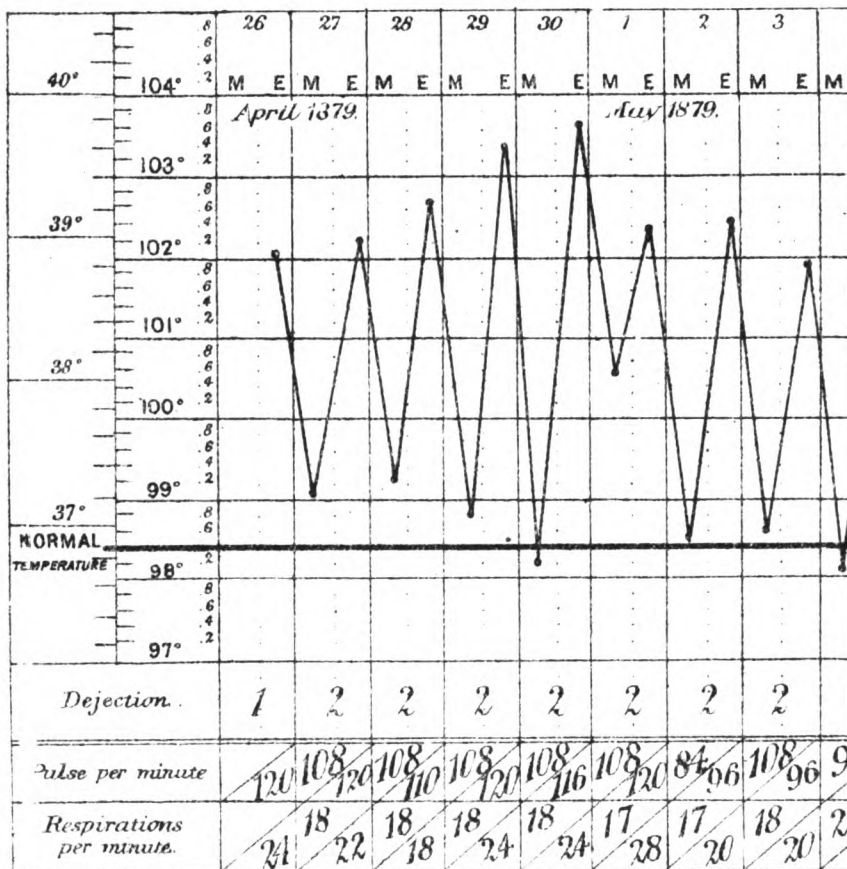
6th Oct. From this date he remained free from fever, although perspiring rather copiously at night; but his testicle continued swollen, and eventually there was suppurations and protrusion of the gland structure to some extent. Towards the end of December he was convalescent.

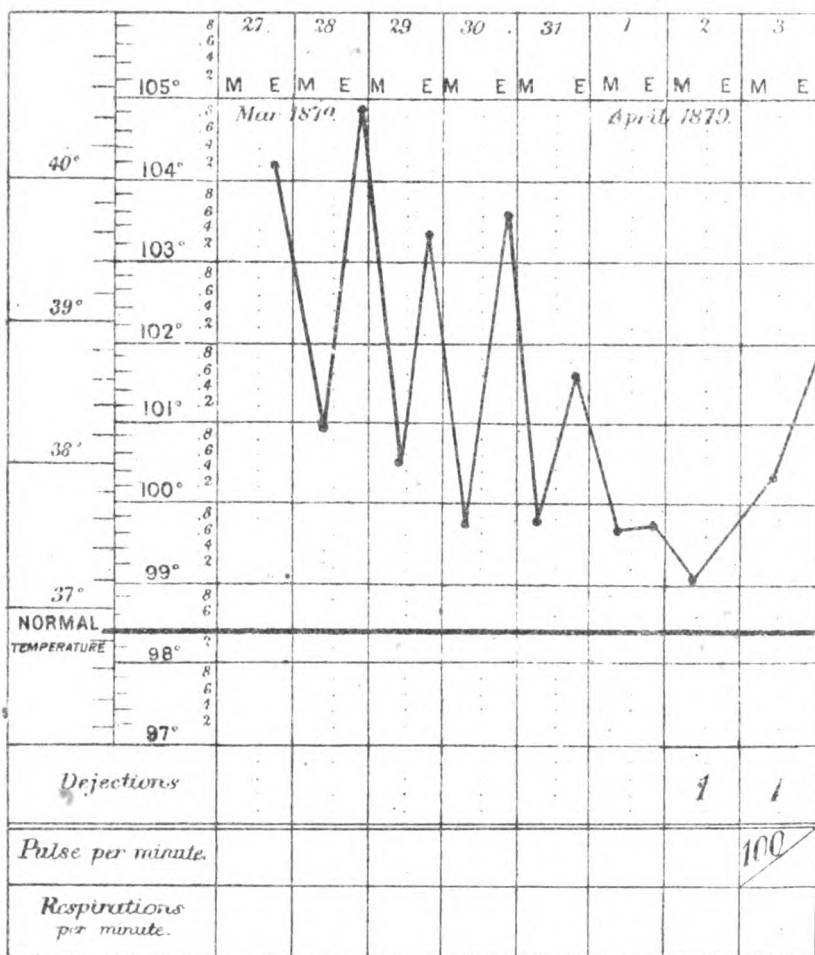
The following was his temperature chart during the acme of the third relapse.

Case V Continued.









III. CASES OCCURRING AFTER RESIDENCE IN MALTA, CYPRUS, AND GIBRALTAR SUCCESSIVELY.

I shall now, by way of comparison, give a brief abstract of three of these cases.

CASE V.—No. 21. Private T. H. Aged 22. 42nd Regiment.

Patient's Statement and previous History.—He went from Malta to Cyprus in July 1878, up to which time he had always enjoyed good health. In Cyprus he suffered from fever and ague, but did not go into hospital. After his transfer to Gibraltar he had a fresh attack of fever and ague, for which he was about six weeks in hospital. He was then invalided home, and arrived at Netley on the 20th of March 1879.

State on Arrival, and Progress at Netley.—He appeared to be convalescent until the 27th of March, on which day he had a return of fever, which was at first thought to be ague. On the 2nd of April he was found to have some enlargement and tenderness of the spleen, but no other abnormal conditions. He was treated by quinine in the usual manner, but the febrile movement continued notwithstanding. The pulse and respirations were at times remarkably frequent; but up to the 20th of May there was no sign of any pulmonary disorder.

24th May. Right ankle swollen and painful.

26th May. Motions streaked with blood. Spleen somewhat larger than before. Liver also a little painful. On the opposite page is the chart of his temperature from March to July 1879.

4th June. No blood in motions. Appetite fair. He is taking liquor arsenicalis in five minim doses.

8th June. Liver and spleen still painful on pressure. Has pain in left shoulder joint as well as in the ankle.

20th June. Much improved, but is still anæmic.

13th July. Bursa of right patella swollen and painful. Splenic dulness much decreased. In all other respects he is better.

22nd July. Bursa still swollen, but less painful.

1st Aug. He is now apparently free from all disease, and he is discharged to duty.

Remarks.—In this case there were no lung complication to which the persistent fever could be ascribed; nor were the affections of the liver, spleen, or joints, if regarded simply as inflammations, such as would account for the thermometric range.

It would be tedious to record in detail the treatment that was adopted. It will be sufficient to state that quinine was given in doses varying from 10 to 40 grains without having the smallest effect in checking the course of the disease. Arsenic was freely given, but it is very doubtful if the recovery was in any way attributable to its action.

CASE VI.—No. 1035. Lance Corporal J. P. Aged 21. 42nd Regiment.

Patient's Statement and previous History.—He was in good health when he went to Cyprus in July 1878. He first suffered from fever in September, and was in hospital six or seven times for it. In November he was transferred to Gibraltar, where he had ague, and was found to have enlargement of both liver and spleen. He was invalided, and arrived at Netley on the 20th of March 1879.

State on Admission, and Progress at Netley.—He was extremely weak, anæmic, and wasted.

4th April. He had considerable pain in both hypochondriac regions, with some tympanites. His spleen was conspicuously enlarged, forming a tumour. His liver was likewise enlarged, but its inferior margin could not be determined owing to the tympanites, and the pain caused by percussion. There was no jaundice, the bowels were regular. The urine was acid, clear, free from albumen, and of specific gravity 1015. He had headache, but no other disorder of the nervous system. The respiratory and circulatory systems were normal.

Treatment.—Quinine 20 grains every night. Acetate of ammonia mixture by day; nitro-muriatic acid compresses over the hypochondria.

8th April. Better. Quinine reduced to 10 grains every night.

14th April. Complained of "slight ague" this morning with increase of headache and of pain in the abdomen. Quinine increased to 20 grains at night. Turpentine stupes to abdomen.

15th. Has had rather severe epistaxis, which he now says he has had several times lately at night. Sleeps badly.

18th. Epistaxis returned last night. He is to have 20 grains of quinine to-night, and a similar dose early to-morrow.

20th. Recurrence of epistaxis last night. He is to have 40 grains of quinine to-day in two doses.

21st. Slight cinchonism. He has had epistaxis again, and there has been some subconjunctival ecchymosis during the night. Lips and tongue dry and brown. Omit quinine. He is to have tincture of the muriate of iron, 20 minims every fourth hour.

22nd. Has had epistaxis and hæmatemesis; the blood that flowed from his nostril was of dark, almost brick-red colour, and did not coagulate. Has cough with bloody sputa, but there are no signs of pneumonia. He is becoming delirious. He is to have acid enemata every four hours, ice is also to be applied to his head after it has been shaved.

23rd. Motions and urine passed in bed. The spleen has been increasing in size, and now reaches the ilium. *Evening.*—He is unconscious. Hitherto the epistaxis has always been arrested by cold and pressure on the nares. This afternoon it could not be arrested without plugging the posterior nares, an operation of considerable difficulty, owing to his being delirious and keeping his teeth firmly clenched. Hypodermic injections of ergotine were ordered.

25th. Continues insensible. There is bleeding from the gums and from the left nostril. His motions are frequent and black (blood). The ergotinic injections are continued. The plug was removed from the posterior nares, as it had become very fetid, and the anterior nares alone were plugged, the oozing from them being only slight. The chart of his temperature is given on opposite page.

26th. No more epistaxis, but yesterday he passed bright blood per rectum. From that time he continued to sink, and he died on the following day.

Post-mortem Appearances.

The chief facts elicited at the post-mortem inspection were that the heart was small, soft, and fatty; that there was congestion of the posterior and lower halves of the lungs, but less in the left than in the right. Both were crepitant throughout.

Liver presented a pigmented appearance on section; its capsule was clear. Weight, 88 ozs. 11 drs. Measurements, 11 in. × 8 in. × 3 in.

Spleen.—Sections very dark. Pulp soft and friable. Weight, 59 ozs. 11 drs. Measurements, 9·5 in. × 5·8 in. × 2·5 in.

Kidneys.—There were slight signs of hæmorrhage into their substance. The capsules were easily separable.

Small Intestine pallid and anæmic. Peyer's patches normal. There was considerable atrophy of the lower portion of the ileum.

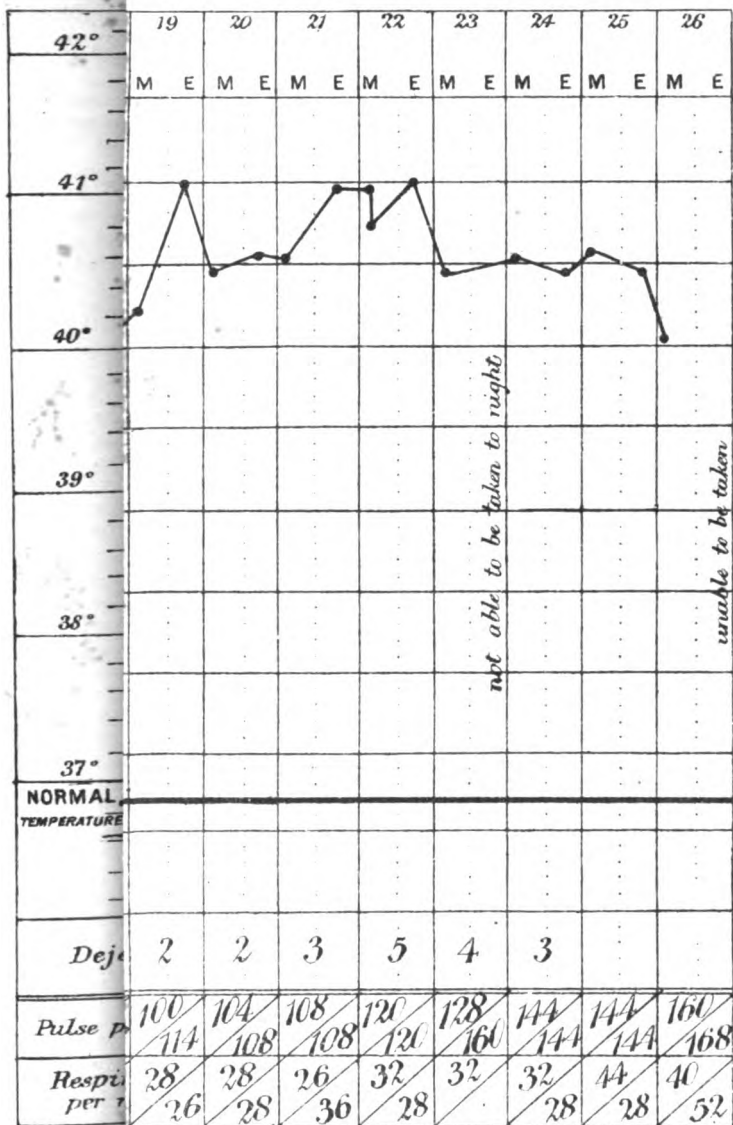
Large Intestines normal.

Brain small, otherwise normal.

Remarks.—In this case the administration of quinine not only did no good but seemed to aggravate the cerebral symptoms.

CASE VII.—No. 858. Private C. H. Aged 23. 42nd Regiment.

Patient's Statement and previous History.—He had served a year at Malta when he was sent to Cyprus. In this island he remained in good health until the first week of August. He then had "fever and ague," but did not go into hospital until the 22nd. He was discharged on the 30th, and did duty until the 17th of October, when he was re-admitted for the same disease. He was discharged after five days, but was taken in again on the 1st of November, and was under treatment 11 days. Shortly after this he was removed to Gibraltar, where he was in hospital twice in December 1878, and once in February 1879 for "ague"; but he performed his duty from the 1st of March to the 17th of May. On the day last-named he was re-admitted to hospital, and he says that on this occasion his disease was not ague because he



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"had no shakes," but he suffered from headache, pains in the back, diarrhoea, and vomiting. This fever lasted three weeks, and during a part of the time he was delirious, and had a slight dry cough, with some pain in the liver and spleen. On its decline he had pains in his shoulders, back, groins, and knees. The latter were swollen, but the testicles, although painful, did not swell. His hair began to fall out in August. On the 5th of September he was invalided, and he arrived at Netley on the 11th of that month.

State on Admission, and Progress at Netley.—15th Sept. He was very weak, wasted, and anæmic. He said he had no pain, but the hypochondria were somewhat tender on pressure. His memory was impaired, but he slept well, and was tolerably cheerful. He perspired profusely at night, but his skin was dry by day. His appetite was good, he was thirsty, and his bowels were rather loose. The liver dulness extended in the right nipple line from the fifth interspace to the costal margin, and the spleen was not perceptibly enlarged. His pulse was weak, and the cardiac impulse could neither be seen nor felt in the recumbent position. He had no cough nor any other sign of chest ailment.

Progress of the Case.—20th Sept. 1879. Spleen slightly enlarged. Has an occasional dry cough. The breathing is rather harsh in the right supraspinous fossa and in the left supra scapular space.

29th Sept. Pain in region of seventh dorsal vertebra. Night sweats most profuse. Liver as well as spleen somewhat enlarged. Has a systolic bruit at the apex. Cough continues, but there is a complete absence of auscultatory signs to account for it. The area of cardiac dulness is normal.

30th Sept. There are occasional sibilant râles in the left mammary region. The cardiac impulse is now visible in the fourth interspace as he lies in bed.

12th Oct. Has pain in right shoulder joint but nowhere else. Sleeps badly, only about four hours a night. Has occasional nausea. Night sweats continue. Cardiac impulse visible in fifth interspace. Superficial transverse cardiac dulness rather increased. Sounds rough. All cough has ceased.

22nd Oct. Says he would be quite well if it were not for his night sweats and debility. No cardiac bruit or abnormal dulness. The liver and spleen have increased in size. The percussion dulness of the latter in anterior axillary line exceeds four inches.

30th Oct. Complains of pains in his bowels.

5th Nov. Pains in belly only occasional.

14th Nov. Splenic dulness measures six inches. Since the 6th instant he has been taking salicylic acid in 20 grain doses with soda four times a day. This is now discontinued, and 100 drops of a one per cent. solution of carbolic acid are to be injected twice a day under the skin, on the right and left of the abdomen alternately.

18th Nov. He has now had eight injections, and although they have been made with the greatest care, the skin of the abdomen is red, swollen, and acutely painful all over. In consultation with Professor Maclean it is decided that this treatment must be discontinued. The salicylate of soda is to be taken in 20 grain doses every four hours; and the inflamed parts are to be covered with a light bread poultice.

19th. The surface of the abdomen is so painful that he dreads the slightest movement.

21st. Pain in left hip. He is much depressed in spirits.

24th. The swelling, pain, and redness have much decreased, but one puncture on each side appears to have caused suppuration.

30th. The centre of each swelling is soft over a space as large as half-a-crown, and there is a ring of hardened structure all round. The poultices are to be continued, but the swellings are to take their own course.

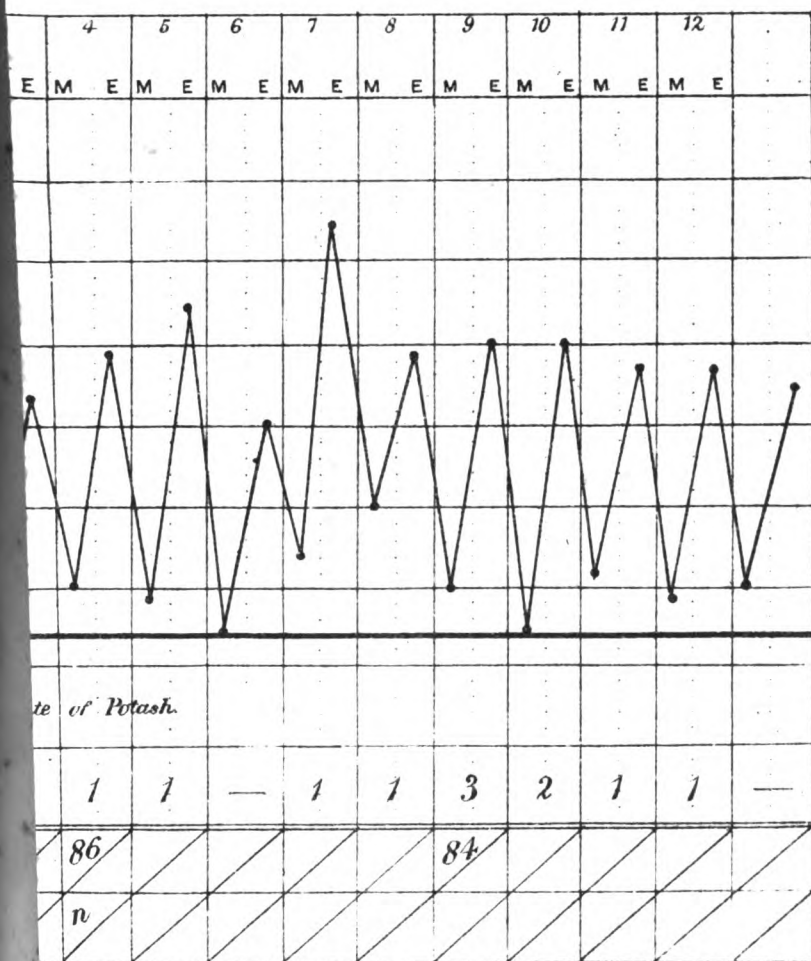
7th Dec. Says he is quite well. The swellings are subsiding. On the left side the skin is red over the centre of the swelling, and there is a small drop of dried pus underneath the surface.

31st Dec. He was examined very carefully to-day with the following results:—The two swellings still remain, and are somewhat indurated. He sleeps well, and his nervous system appears to be recovering its normal condition. He perspires a little at night, and when he sits near the fire by day. He is pale and rather weak, but is regaining both colour and weight. His tongue is slightly glazed and red at the edges. His bowels are regular. The liver dulness commences at the fifth rib in the right nipple line, and reaches to the

costal margin. The exact inferior limit is obscured by a tympanitic state of the intestines. The splenic dulness between the anterior axillary and nipple lines begin at the sixth interspace, and extends to the costal margin. Its anterior limit is at a point one inch internal to the left nipple line in the direction of the umbilicus. His pulse is 84 and regular. The cardiac impulse can neither be seen nor felt, but is ascertained by auscultation to be at about the fifth rib, or rather above it, in the parasternal line. The area of dulness is normal. He has a very trifling cough, but no other sign of chest ailment. His blood presents nothing abnormal when examined under a power of 1300 diameters. His temperature remains nearly normal. It may therefore be concluded that he is at length convalescent, although he has evidently been rendered unfit for further service as a soldier. This chart of temperature is shown on opposite page.

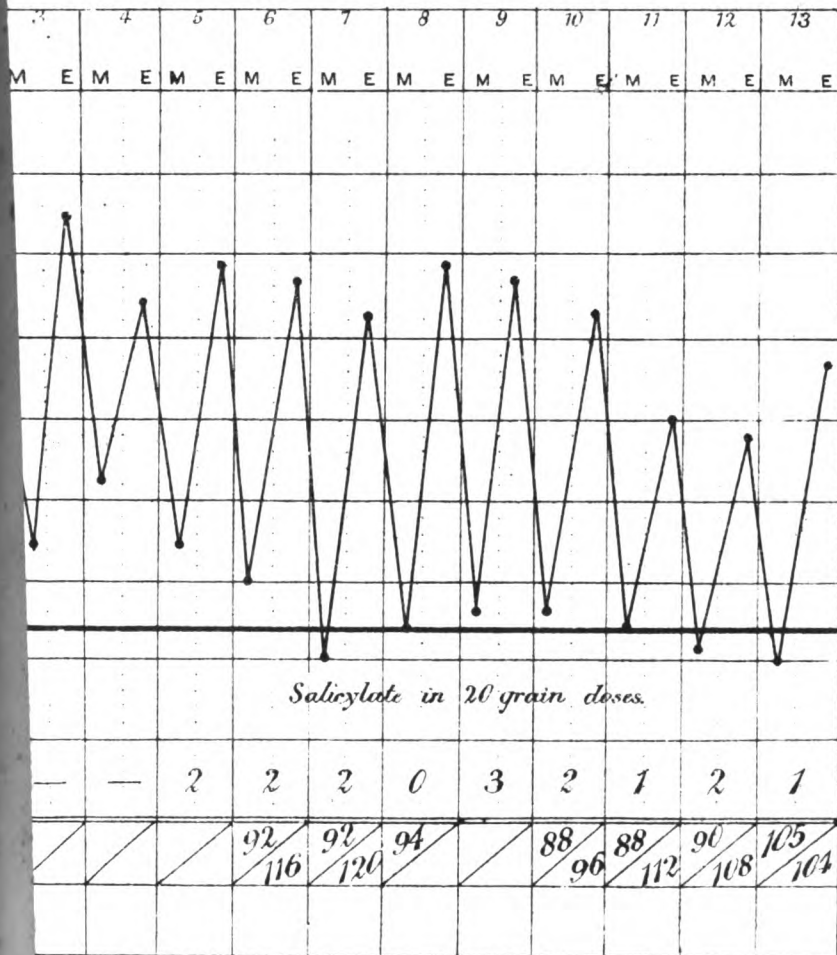
Remarks.—It can scarcely be doubted that the cases numbered V. and VII. were examples of what I have ventured to name the complicate fever, and the question arises, where did they originate, in Malta, Cyprus, or Gibraltar? That they did not originate in Malta is probable from the period at which the features peculiar to this fever began to show themselves; and that they were not contracted in Cyprus is probable for a similar reason as well as from the circumstances that amongst the troops who went out direct from England, and who also returned direct from Cyprus, there were no cases that presented the *rheumatic* symptoms of the disease during their detention at Netley. The conclusion would therefore be that they were contracted in Gibraltar. But what was the nature of Case VI.? In its clinical features it was not unlike Cases I. and II. All these resembled each other in their severity, and in their resistance to the influence of quinine. In Case No. I, it will also be remembered, there were at least two distinct attacks whilst the patient was at Netley, and although these and similar cases were supposed at the time to be malarial remittents, I must confess to having strong suspicions that they were cases of complicate fever, more severe, no doubt, than these are usually seen, because they occurred in subjects reduced by previous attacks of severe malarial fever, and still suffering from its effects. That Case VI. was contracted in Gibraltar, and that it was one of complicate fever, I have now little doubt. If No. II. was of the same kind it would be sufficient to prove that complicate fever originated in Cyprus, and it is remarkable that the patient in this case belonged to the Army Service Corps, which was quartered, not in camp, as a rule, but in the towns, among the native population. Similar reasoning would apply to another of the fatal cases, which, however, I have no space to record. This patient belonged to the Engineers, and his fever very much resembled that of No. II.

I think then it may be concluded that, in the vast majority of instances, the fever contracted in Cyprus was of a malarial character, but it is not improbable that some cases of complicate fever may also have originated there. Nothing is yet known regarding the incubation period of the latter. Possibly, therefore, many of the men who went from Malta in apparently good health were already infected with it before they left. If this was the case, there can be little doubt that when they began to suffer from malarial fever, the co-existence of the two diseases must have rendered the diagnosis and treatment embarrassing to an extreme degree, as it certainly did after the return of the invalids to this country, and this difficulty must have been equally great whether the complicate fever preceded the malarial, or was preceded by it.



DANGERFIELD LITH 22 BEDFORD ST COVENT GARDEN
1817





DAVERFIELD, LITH 22 BEDFORD ST COVENT GARDEN
1870

APPENDIX No. IV.

MEDICAL HISTORY OF THE WAR IN ZULULAND IN 1879.

By Surgeon-General J. A. WOOLFRIES, M.D., C.B., C.M.G.

ZULULAND lies on the the east coast of South Africa, north-east of the Colony of Natal, and comprises an area of about 15,000 square miles.

It is bounded on the north by the river Pongolo, beyond which lies the Swazie country; on the east by the Indian Ocean; on the south by the Tugela River, which flows between it and Natal; and on the west by the disputed territory.

The face of the country much resembles that of Natal, the land rising in a series of terraces from the sea. The coast line is low, with sand hills covered for the most part with scrub. The coast is hot and unhealthy, and within a belt of 15 or 20 miles is malarious, in consequence of the land being interrupted by swamps and lagoons caused by the sluggish flow of the rivers as they approach the sea, and the bar formed at their mouths. The second terrace commences from this belt, and consists of broken ridges and hills covered with grass. Beyond this tract, to the north-west, a high rolling upland extends, which is much intersected by deep gullies and ravines covered with wood, called kloofs, and presents numerous conical hills, some of which reach a height of 3,000 feet above sea level.

Physical features.

Along the Buffalo and Tugela rivers, from Rorke's Drift southwards, the country is mountainous, and at the junction of these rivers it is very rugged. Northwards from this drift the Buffalo has open banks. As in Natal, the most part of the country, both hill and vale, is covered with grass; the ravines are invariably clothed with bush; whilst the high lands in some instances are covered with forest.

It would appear that since the first settlement of the Colony of Natal and of the Transvaal Republic the attitude of the military powers in Zululand had been a subject of increasing anxiety to the Governments of both countries. The emigrant farmers from the Cape Colony, who founded the Transvaal Republic, had in the year 1840 been victorious in a war caused by the treacherous and cruel massacre of a large number of their countrymen by Dingaan, then king of the Zulus. The war ended on the death of Dingaan, who was succeeded by his brother Panda, the ally of the emigrant farmers. They assisted him to obtain supreme power in Zululand, and he remained till his death on terms more or less friendly to them and to the Government of the Transvaal.

Course of events which led to relations with Zulu king.

On the 12th April 1877 the Transvaal was annexed to the British territory in South Africa, when all rights and responsibilities of the Transvaal Republic devolved on the Government of Great Britain.

The Government of the Colony of Natal had always been friendly to the Zulu nation, and as long as the Zulu king, Panda, lived it had seldom found occasion to complain of any unfriendly act towards it on the part of the Zulus. At Panda's death in 1872 he was succeeded by his son Cetewayo. His peaceable succession was mainly due to his recognition by the British Government of Natal some years before, when there were many rival candidates for the succession, and to the presence of the British representative at his installation. Many solemn promises and engagements were then made by Cetewayo, which were formally published to the people, and accepted by the British Government as guarantees for the better and more humane government of Zululand, and for the greater security of peace with all his neighbours. These promises were never fulfilled; the cruelties and barbarities of Panda's reign were aggra-

vated during Cetewayo's, and his relations with his neighbours were conducted in a spirit fatal to peace and security. He maintained a formidable military despotism, which became not only a grievous oppression to his people, but a standing menace to all his neighbours. He advanced claims to countries which had once been overrun by his predecessors, but which had now for many years been under other sovereignty. He at the same time repeatedly requested the consent of the British Government to wars of aggression which had for many years been laid aside. In one direction only was there the slightest excuse for any disagreement with his neighbours, and that was on the western boundary of Zululand, between the Buffalo and Pongolo rivers, where a large tract of land was claimed by the Zulus which had long been occupied as Transvaal territory by Transvaal subjects, in virtue of a cession which the Transvaal Government alleged had been made to them by the Zulus many years previous. The Natal Government had been repeatedly requested by the Zulus to arbitrate in the matter, and had promised to do so. Meanwhile the annexation of the Transvaal brought a peaceful solution of this dispute still more within the power of the Natal Government, which had always been most friendly to the Zulus. But, in the meantime, since his installation the tone of Cetewayo in his communications with Natal had essentially altered, notably, in reply to a remonstrance regarding the barbarous massacre of a number of young women by his orders, Cetewayo addressed the Government of Natal in terms of unprecedented insolence and defiance, affirming that he was not responsible to them for anything that he might please to do, denying his solemn promises made at his installation, and declaring his intention of shedding blood in future on a greater scale than in the massacre referred to. These declarations made in 1876 were followed up by a course of intimidation pursued towards European missionaries who had been long settled in the country by permission of Panda. Some missionary converts were on various pretexts killed, the lives of others were threatened, and the missionaries were driven to fly from the country for safety.

Some months subsequent to the annexation of the Transvaal, when Cetewayo had had ample time to realize the altered relations of that territory with the British Government, he ordered a military force to occupy the territory he claimed between the Buffalo and the Pongolo, to build there several military encampments on the advanced border, and to serve in his name peremptory notices to quit upon the peaceful inhabitants, European and Native, far beyond the limits of his previous sovereignty. These notices were accompanied by raids to the north of the Pongolo, made by chiefs under Cetewayo's protection, who, after murdering many persons, carried off others with their cattle and returned into Zululand.

Notwithstanding these outrages the Natal Government were not deterred from their attempt to do justice in the matter of the disputed territory. At the request of Cetewayo they consented to appoint a Commission to inquire into the merits of the dispute, with a view to its settlement by arbitration. The Commission having met decided that the greater portion of the land in dispute between the Buffalo and Pongolo rivers, of which the Zulus had lately taken forcible possession, had never ceased to belong of right to them, and the High Commissioner confirmed this decision.

In the meantime, however, between the decision and confirmation, occurred several events which materially affected the relations of the British Government with the Zulus. The King sent repeated notices to quit to European subjects of the Transvaal long settled north of the Pongolo within the recognised boundary between the Transvaal and Zululand, these notices being enforced by raids into Swazieland. Further encroachments were only checked by the movement of a detachment of British troops from Utrecht to Luneburg on that frontier.

Furthermore, in the latter part of July 1878 two most deliberate violations of British territory were committed by the sons of an influential chief, Sirayo, and the demand for redress for these violations was not complied with.

In the latter end of August the General Commanding, in view of the attitude of Cetewayo, prepared for the eventuality of war, and sanctioned expenditure for transport, storehouses, bridges, and equipment of different sorts in order that the troops might be able to take the field at the shortest possible notice.

A demand for some troops from England was now made, as in the event of

Preparations
for war with
the Zulus.

Military move-
ments in the

an invasion of Zululand being decided upon it was contemplated to operate on the five following lines, viz. :—

1. Durban, Fort Williamson, on Tugela River.
2. Pietermaritzburg, Greytown and Middle Drift, on Tugela River.
3. Ladysmith, Rorke's Drift, on Buffalo River.
4. Newcastle, Utrecht, on Blood River.
5. Middleburg, Derby, on Pongolo River.

Each of the columns on these five lines was to have a complete battalion of eight companies of British Infantry. At Pietermaritzburg there was to be a reserve of one battalion and one dépôt company. At each of the other intermediate bases mentioned a company was necessary for the protection of stores and lines of communication.

It was considered absolutely certain that the number of Zulus opposed to our forces would be at least 10 to 1 of the total regular force.

Everything being now perfectly quiet in the Cape Colony, three companies of the 1/24th Regiment were withdrawn from King William's Town, two of which were ordered to Natal, the other to occupy the territory lately added to the British Government on the right bank of St. John's River, Pondoland.

Troops withdrawn from King William's Town.

At this time in the Transvaal the legacy of trouble in connexion with Secocoeni (handed down by its former Government) in the north-west demanded the presence in that quarter of Imperial forces. The 1/13th Regiment was therefore ordered to the Lydenburg district, and the 80th to replace it at Pretoria.

Attitude of Secocoeni required the presence of a force in his country.

An invasion of Natal was now considered more imminent than it had been for many years, and the possibility of resisting a sudden raid by the existing means for defence appeared almost hopeless, consequently the danger that threatened Natal appeared very great. The Natal border line of defence was, therefore, mapped out into three zones, lower, middle, and upper. The first contained the main road from Durban to Tugela mouth, the second that from Pietermaritzburg via Greytown to the Middle Drift of Tugela, and the third that from Ladysmith to Rorke's Drift on the Buffalo River. The border front from the Tugela mouth to Rorke's Drift is about 100 miles, and the depth of each defensive zone is about 60 miles.

Military situation with special reference to Zulu border in the event of an invasion by the Zulus.

The most advanced line was to be guarded by the Natal Natives, the second line by the Mounted Police, and the third line in reserve by British Infantry at Durban, Greytown, and Ladysmith.

A force under Colonel Rowland which went to attack Secocoeni's stadt had to return on the 6th October for want of water, and owing to the advent of horse sickness when within a short distance of it. Active operations against that chief were therefore suspended, and several of the outposts in the district were abandoned. Troops were left only at Middleburg, Lydenburg, Pretoria, Derby, and Klipstapel; a detachment of the 80th Regiment being afterwards sent to Luneburg.

Retreat of Col. Rowland's force.

The latter end of October the King called up eight regiments and ordered them to move at once to his northern border. It appeared doubtful whether this was a measure of precaution against attack, or part of a concerted plan of offensive action against the Colony, of which there had not been wanting some evidence, such as the attack by Umbelini on our allies the Amaswazies.

Cetywayo collects his army.

The following movements of British troops, however, at once took place: two companies of Buffs and guns at Greytown were pushed forward to Thring's Post on the military road leading to the Lower Tugela, and to reinforce these three companies were sent from Pietermaritzburg; four companies 2/24th Regiment proceeded from Pietermaritzburg to Greytown; three companies of the Buffs, just arrived from the Mauritius, started for the Lower Tugela Drift. The Mounted Police occupied Krantz-Kop, sending a detachment to join the Buffs at Thring's Post.

Movements of British troops.

The organization of a force of 6,000 Natives was now carried out with the greatest possible despatch. The whole available force of Mounted Natives was at once mobilized and placed under a competent European commander. They were assembled on the high eastern slopes of the Biggersberg, &c. near to Rorke's Drift as possible.

The Mounted Volunteers were ordered to hold themselves in readiness to come out at a very short notice.

Border Police established.

Border Police were at once established, with a superintendent, whose duty it was to ride from station to station, so as to ensure an uniform system, and to exert the fullest amount of vigilance.

It was intended that the Border Natives under their own organization should meet the first brunt of an invasion.

During the next few days the news from Zululand did not modify the opinion expressed that the movements of Cetewayo might be either for defence or attack.

Supplies of cattle for commissariat purposes were ordered to be sent in by his headmen.

These and other signs were considered sufficiently serious by the Natal Government to warrant the calling out of certain corps of volunteers.

Natal Mounted Police placed at disposal of General.

The Natal Mounted Police (150 strong) were placed at the disposal of the General Commanding, and directed to take up a position to watch Rorkes Drift.

The 5 companies 1/24 Regiment remaining at King William's Town proceeded at once to Natal, being relieved by 4 companies, 88th, from Cape Town, where the garrison duties were taken over by the volunteers.

There being only 3½ regiments of British infantry and 12 guns to defend a border line of 300 miles (the 1/13th and 80th Regiments being in the Transvaal) another appeal was made to England in the middle of November for reinforcements, and the commodore on the station was called upon for as many sailors and marines as could possibly be spared for service on shore.

Cetewayo's forces on the move.

A portion of Cetewayo's forces now moved secretly by night to the south, while the regiments of young men were ordered to watch the Natal border, and the older men remained with the King.

Messengers sent to Zulu King.

On the 17th November messengers were despatched by the High Commissioner directing the Zulu King to call together his Great Council to receive certain communications which would be ready for delivery to his messengers about the 7th December at the Lower Tugela. This referred to the award on the disputed territory, and certain demands in connexion with the recent outrages by Sirayo's sons. Guarantees for the future and reparation for the past were demanded, the main points being the disbanding of the Zulu army, its future organisation, and the reception of a British Resident.

The Zulu army was then under arms, and their outposts and ours were within rifle shot every night on the Lower Tugela, and there were signs of restlessness in the Utrecht district.

Natal Mounted Volunteers called out.

Within the next 10 days the Natal Mounted Volunteers were called out, and the whole European forces, Imperial and Colonial, available for operations in Zululand were concentrated at the posts decided upon.

Employment of civil practitioners, civil surgeons, and hospital dressers.

Owing to the vast extent of country over which the troops were operating, the large number of stations and outposts, and the frequent patrols, a large number of medical officers was found necessary. Of the 14 surgeons at one time in the Transvaal, 6 had been released by the abandoning of active operations against Secocoeni, but more than double that number were now urgently required. To meet the difficulty civil practitioners were employed in all the large garrison towns, and after some difficulty 3 or 4 civil surgeons were found at Durban and Cape Town who engaged to serve with troops. In addition to these a few medical students who had passed their first examination were engaged as hospital dressers.

Ambulances.

There was no dual system in the Zulu war, as in the war in the Cape Colony; the whole of the forces, regular, irregular, volunteers, and native were under the Army Medical Department.

The question of ambulances caused some anxiety. In the Cape Colony campaign the ordinary ox waggons were used, fitted with a framework called a cartel, having springs, and slung inside the body of the waggon. A number of these cartels had been forwarded to Natal, but it was found that the waggons of this Colony were of a different pattern, and were not sufficiently wide to receive them. As ambulances were required without delay, travelling waggons with springs, such as are used by the better class of colonists, were bought up and converted into ambulances, but only a few of them could be obtained. Therefore 5 store waggons with springs were procured from the Ordnance Department and these were adapted to the purpose. As the war assumed greater proportions, however, more ambulances were required, and it was only

after some difficulty that a tradesman could be found who engaged to complete and hand over one every fortnight. He constructed 12 which proved to be most serviceable. They were ordinary waggons of the country, each having on its floor a platform resting on 6 stout carriage springs, 3 on either side, leaving a space of some 18 inches between the floor and the platform. On the platform behind were arranged 3 hospital stretchers abreast for lying down patients, and in front a double row of seats, back to back, for 14 patients sitting up. A double tent covered the whole length of the waggon, and there was ample circulation of air through the open sides, while canvas curtains excluded the rain. The men's kits and rifles, with tents for use on the road, and cooking utensils, were carried in the space between the two floors. The length of the vehicle made its motion easier over the rough roads, and the jolting was counteracted by the springs most satisfactorily. 28 ambulances of all sorts were collected, but it was considered that double that number would be required. It was therefore a great relief when 30 English regulation ambulances arrived, and just in time to relieve a pressure that was occurring at Fort Pearson.

Considering the rough and rugged nature of the country for the most part over which the troops were operating, it was advisable to have a supply of Ashanti cots in which to carry the seriously sick and wounded; 8 cots were therefore attached to each column in addition to stretchers.

For the purpose of carrying the Ashanti cots, and for removing the wounded from the scene of action to the front dressing station, a corps of Native bearers was established numbering 160, making one company and a half with 16 men as reserve for casualties; a company consisting of 96 Natives with 16 of the Army Hospital Corps, and half a company being attached to each column.

It was only after the battle of Ulundi, which virtually terminated the Zulu war, that a bearer company of the Army Hospital Corps arrived in Natal. This bearer company, however, was afterwards employed in the Secocoeni campaign, when it did excellent service.

The equipment of a field hospital of 200 beds, as laid down in the Medical Regulations, being far too much for warfare in such a country as South Africa, where the force was broken up into numerous detachments and posts, it was found most convenient to take this as a basis and divide it by 8, each component part being designated a field hospital of 25 beds.

The following Field Hospital Regulations were issued for the use of all concerned, but especially for the large staff of civil surgeons attached to the Department, who were necessarily unacquainted with the system adopted in military hospitals and in connexion with the medical charge of troops in the field.

Each field hospital will be equipped for the accommodation of 25 patients, and will consist of—

- | | |
|--|---|
| 2 Medical officers. | 1 Cook, Army Hospital Corps, or regimental. |
| 2 Men, Army Hospital Corps, 1 to be non-commissioned or acting non-commissioned. | 1 Man in charge of ambulance. |

Orderlies in proportion to number of sick. If sick exceeds 10, one additionally orderly; if 20, two extra orderlies to be obtained regimentally.

When the advance takes place the front field hospital will consist of the equipment of two field hospitals, viz., 50 beds, but 2 surgeons only will be attached, 1 of whom should belong to the Army Medical Department.

- | | |
|--|--|
| 2 Circular tents for medical officers. | 5 Double circular tents for patients, or 2 double circular tents and 1 hospital marquee. |
| 1 " " surgery. | 1 Set (four) waterproof ground sheets. |
| 1 " " hospital servants. | |
| 1 A., B., and C. canteen, complete, for 25 patients. | 1 Pick. |
| 1 Large or 2 small medical comfort boxes. | 1 Spade. |
| 1 Geneva flag. | 2 Sore basins. |
| Wood chopper. | 6 Bed-covers, waterproof. |
| | 30 Blankets. |
| | 1 Scrubbing brush. |

1.
Personnel.

2.
Camp Equipment.

3.
Hospital Equipment.

- | | |
|---|--|
| <p>1 Bucket.
18 Paillasse covers.
25 Bolster cases.
8 Cork beds.
1 Meat chopper.
1 Small-tooth comb.
1 Corkscrew.
2 Feeders.
1 Filter.
1 Funnel.
5 Gowns, blue.
5 Waistcoats, blue.
5 Trousers, blue.
2 Camp kettles.
2 Reaping hooks.
6 Flannel shirts.
6 Pairs slippers.
6 Pairs socks, woollen.
36 Single sheets.
20 Waterproof sheets.
6 Small hair pillows.
2 Feather pillows.</p> <p>4.
<i>Medical Equipment.</i></p> <p>1 Pair of field panniers, with set of capital instruments and hypodermic syringe.
1 Field companion and water bottle.
1 Small fracture box.
2 Haversacks, Army Hospital Corps.</p> | <p>1 Tin opener.
1 Lantern.
1 Operating lamp, with reflectors.
2 Spitting cups.
1 Stomach warmer.
1 Hand saw.
25 Triangular bandages.
1 Portable operating table.
5 Ophthalmia napkins.
1 Latrine screen.
8 Field bedsteads, or boards and trestles.
12 Cholera belts.
6 Cotton handkerchiefs.
8 Yards green gauze, for veils.
2 Old linen sheets, for rags.
1 Handscoop, large.
12 Pillow slips.
1 Pair of deal boxes, with hinges and box lock, to hold hospital equipment.</p> <p>1 Set of tooth instruments.
1 Stomach pump.
1 Post-mortem case.
1 Set of field splints.
20 lbs. picked oakum.</p> |
|---|--|

5.
Transport.

- | | |
|---|--|
| <p>1 Store waggon.
1 Water cart.
1 Ambulance, with stretchers.
1 Horse and saddlery for each surgeon.</p> | <p>1 Pack-saddle and bridle, complete.
1 Pack-horse and blanket.
2 Stretchers, field, with slings.</p> |
|---|--|

6.
Bedding.

The paillasse and bolster cases, and waterproof cases when required, will be invariably filled with dried grass or straw, or whatever substitute may be available. Indents will first be made on the Commissariat Department for straw for this purpose; should this not be available, application will be made to the Officer Commanding the Troops for a fatigue party to cut and collect grass from such locality as the medical officer may select; should neither of these be procurable, a report should be at once forwarded to the Senior Medical Officer of the district for transmission to the Principal Medical Officer.

7.
Sheets.

Sheets will, when there is no risk of dampness, be used to protect the blankets from being unduly soiled.

8.
Blankets

One hospital sheet is sufficient to go under and over the patient. Each man coming to hospital should bring with him his field blankets, which, with the addition of one hospital blanket, will in most instances be sufficient.

9.
Bedsteads.

When boards and trestles cannot be supplied by the Ordnance Department, medical officers are expected to exercise ingenuity in extemporising field bedsteads, at least for their serious cases, and when the hospitals are likely to be located in the same place beyond a few days. The following is quoted from Professor Longmore's work on gunshot wounds:—"This temporary bedstead is formed by two rows of stakes driven into the ground, rising 14 inches above the surface, and standing asunder, the width and length of the frame to be determined by the size of the paillasse. The cross rails are made of the same material split asunder, the head rail being 6 or 8 inches higher than the others." It is suggested that strong pieces of riem stretched from stake to stake would do instead of cross rails, and be more quickly provided.

Soldiers coming to hospital will bring their arms and ammunition, together with their valises. These will be taken charge of by the non-commissioned officer of the Army Hospital Corps.

A field ration will be drawn daily for each patient, and as this contains bread, meat, and groceries, sufficient for a man in full health, it ought, by suitable cooking, and with the addition of some of the following extras, to be capable of being adapted to most cases of illness.

Preserved milk, essence of beef, arrowroot, rice, brandy, and port wine, can be obtained on requisition from the Commissariat Department. Fresh milk, eggs, and fowls will, when procurable, be purchased by the commissariat officer on the requisition of the medical officer, which must, however, always be furnished 24 hours before the time of intended use. The medical comforts in the medicine field pannier are never to be used, except on some unforeseen emergency, or in action, and are as soon as possible to be replaced by indent on Commissariat.

In the canteen which accompanies each man, and in the A. B. and C. canteens provided for each hospital, will be found the means of cooking and serving the diets. Wood will be obtained from the Commissariat Department, or procured by a fatigue party on application to the Officer Commanding.

A person to undertake the hospital washing will be provided by the Army Medical Department, and paid by the Army Pay Department, at each position in which a field hospital is formed.

Latrines will invariably be dug for the use of the hospital establishment and patients, and, in addition, a cesspit at some distance for the reception of all refuse and soil carried out of the hospital, and which shall on no account be thrown into the latrine. The *excreta* of enteric and dysenteric patients will always be disinfected. Dust barrows can easily be extemporised by obtaining from the Commissariat small empty packing cases, to the sides of which sticks can be lashed as handles. Half-barrels will be found useful for washing and other purposes.

A couple of threads of worsted to be drawn through the blister, and the sock to be well soaped over the injured part.

Rum will only be issued to troops on the recommendation of the medical officer in charge, who will insert in the weekly return the circumstances which rendered its use necessary.

Trenches must always be dug round the hospital tents. The curtains of hospital and camp tents should be raised daily for purposes of ventilation. The tents should be struck periodically to allow of the ground on which they stood being aired. Camp grounds should be changed from time to time for obvious sanitary reasons.

The physical condition of the drinking water should be examined frequently, and the site from which it is to be drawn selected with strict attention to the rules laid down on that subject.

Requisitions for extras to be made out on the printed forms in the Requisition Book, the counterfoil being filled up and retained.

Extras to be entered daily on the diet sheet of each patient, and these diet sheets to be forwarded at the end of each month to the Principal Medical Officer.

War Office Form 175 to be filled in daily, and furnished at end of month to the Commissariat Department, a copy of the total of each article expended, as shown at the bottom of this return, being sent to the Principal Medical Officer.

The admission and discharge of each man must be carefully noted in the Admission and Discharge Book, and on his discharge from hospital a leaf from the Medical Certificate Book must be forwarded to the medical officer in whose custody his medical history sheet is.

Morning states will invariably be kept, and transmitted, when practicable, to the Senior Medical Officer of the district. From these will be calculated the average daily sick.

One weekly return in peace time on Form 294, but during active operations one on 294a, and the second on 294, or two on 294, will be sent to the Principal Medical Officer as soon after the termination of the week as possible.

10.
*Arms,
Ammunition,
and Valises.*

11.
Diets.

12.
Extras.

13.
Cooking.

14.
Washing.

15.
Sanitary.

16.
Foot-sore men.

17.
Issue of Rum.

18.
Tents.

19.
Water.

20.
Requisitions.

21.
*Diet Sheets—
Returns.*

22.
W.O. Form, 175.

23.
*Admission and
Discharge Book
and Medical
Certificate.*

24.
Morning States.

25.
Weekly Returns.

In this will be given the sanitary state of each camp, and the average daily sick for the week.

Irregular and Native troops to be shown each on a separate return made on forms supplied for the purpose, or extemporised in manuscript as briefly as the required information will admit.

26. *Movements of Troops.* Senior Medical Officers to notify all movements of troops belonging to their columns to the Principal Medical Officer.

27. *Special Reports.* Every case of importance, or circumstance requiring special attention, is to be at once reported, through the Senior Medical Officer, to the Surgeon-General.

28. *Stretchers.* The Senior Medical Officer will satisfy himself that the prescribed number of stretchers are with the column. Agreeably to paragraphs 332 and 333, page 53, Revised Army Medical Regulations, two stretcher bearers per company will be detailed by commanding officers to carry wounded to the dressing stations, under the medical officer in charge of the regiment, battery, or detachment. These stretcher bearers will never be removed from their own battalions without the special sanction of the General Officer Commanding.

When an action is expected, the stretcher bearers will deposit their rifles and valises in the carts, and proceed with the stretchers to the scene of action, under the medical officer.

29. *To replenish Medical Comfort Boxes and Field Panniers.* Every medical officer in charge of troops will be careful to fill the medical comfort boxes before leaving a commissariat dépôt, also to replenish the field panniers and companions, if possible, before an advance takes place.

30. *Deaths to be reported.* All deaths are to be at once reported. Full particulars as to corps, rank, and name are to be given. Officers' death reports are to be invariably accompanied by a brief abstract of the case.

31. *Before an Action.* Before an action, the front field hospital will be cleared of all sick and wounded who are fit to be removed to the advanced dépôt or base hospital, as the case may be.

32. *During an Action.* The medical officer who first sees a wounded man will on no account omit to append a diagnosis ticket, giving all possible information in the following form, keeping a copy from which he can compile the nominal return required at the end of every action :—

DIAGNOSIS TICKET.

Number and name.
Rank and regiment.
Wound.
Treatment.
Signature of surgeon.

33. *After an Action.* A list of wounded will be sent as soon as practicable to the Officer Commanding and to the Principal Medical Officer, on the subjoined form, and W.O. Form 151a. will accompany the next weekly return :—

RETURN OF WOUNDED IN REGIMENT IN THE ACTION OF .

Nominal Return.

Regt.	Rank and Name.	Wounded.			Total Wounded.	Nature of Wound, and by what inflicted.
		Dangerously.	Severely.	Slightly.		

After an action the ambulances of the second line are on no account to convey sick and wounded further than the advanced dépôt.

When patients are transferred from one hospital to another, the Medical Officer in charge will observe the following rules :—

1. The sick will receive a hot meal before starting; they will be supplied with cooked rations for two days, together with a sufficiency of preserved meat and vegetables for the rest of the journey. They will also be provided with sufficient tent accommodation and cooking utensils, water bottles, H P. (if the ambulance be not furnished with a water barrel), medicines, and medical comforts, as well as with their own arms and ammunition.

2. A non-commissioned officer or private of the Army Hospital Corps, if available, and otherwise a non-commissioned officer or private of some other regular corps, will invariably accompany the ambulance.

3. A nominal roll (in duplicate) of the sick, showing their diseases, dates of admission, and treatment, together with date of departure, and probable date of arrival at the next hospital, is to be made out. One copy is to be forwarded without delay, and with the usual medical certificate, to the medical officer to whom the sick are about to be sent; the other to be given to the medical officer or dresser proceeding in charge.

Soldiers coming to hospital must bring with them a sick report in duplicate, containing regiment, name, and number, with a space for the surgeon's remarks, in which the medical officer will write either "Admitted," "Detained for day," "Medicine and duty," or "Duty," as he may decide. One of these sick reports will be taken back to the regiment by the non-commissioned officer who marched the sick to hospital, in order that the men's rations for that day may be supplied from the regiment.

The names of men detained in hospital will be sent as soon as possible to officers commanding regiments.

The field hospital of a column on the line of march will, in accordance with paragraph 10, Field Hospital Regulations, 1st January 1878, follow in rear of its brigade and in front of all baggage.

Medical officers, in addition to the usual transfer receipt, will, on giving over or receiving a field hospital, send a certificate, in accordance with paragraph 32, Station Hospital Regulations, Army Circular, 1st February 1878, "that the instruments, medicines, hospital equipment, clothing, and stores held on inventory are in good condition, sufficient, according to regulation, and kept in safe custody;" to which will be added the words, "I have verified the above by personal inspection." They will also make periodical inspections of their hospital and medical equipment and stores, and will never allow their stock of medicines to be reduced below one half without at once forwarding indents for their renewal. It is also expected that, should delay unavoidably occur in the supply of any particular drug, the most suitable substitute on hand will be made use of in the interval.

A bandage with lint should be found in the left-hand trousers pocket of every wounded soldier.

Will be applied for on W.O. Form 172, and forwarded to district paymaster through district medical officer.

1. The medical officer will on no account omit to make the usual weekly health inspection, directing his special attention to the early detection of scurvy should such show itself.

2. He will ascertain that, after 14 days from first taking the field, lime juice is issued whenever fresh vegetables are not procurable.

3. He will, not less than twice a week, inspect the ration meat before it is cut up.

4. He will satisfy himself that the camp grounds and vicinity are clean; the surface drainage sufficient; that all refuse, offal, and carcases of animals are properly disposed of, and all sanitary precautions taken.

5. He will report any sanitary defect or omission coming under his notice to the officer commanding the troops and the Principal Medical Officer, informing the latter whether it has been remedied.

6. The Senior Medical Officer of each column will be responsible for the efficient working of all medical arrangements along the line of communication to his base hospital.

7. He will, from time to time, make such inspections of the field hospitals as he may deem necessary.

34.
*Transferring
Patients from
one Hospital
to another.*

35.
*Admission of
Patients into
Hospital.*

36.
After a March.

37.
*Position of Field
Hospitals.*

38.
*Transfers from
one Medical
Officer to
another.*

39.
Field Bandages.

40.
*Extra Duty
Pay.*

41.
*Medical Officers
in charge of
Troops in the
Field.*

8. He will instruct the medical officers in charge of field hospitals to notify to him all changes of position which the progress of military operations may have rendered necessary.

9. He will make such changes in the distribution of medical officers as events may render unavoidable. But these are always subject to the approval of the officer commanding the column, and must be notified to the Principal Medical Officer.

10. He will examine all official returns and documents received from the medical officers along the line of communication, and with the column, and be responsible for their immediate transmission to the Surgeon-General.

11. He will see that the local field hospital regulations are strictly carried out by all medical officers under his orders.

12. He will be responsible that all deficiencies in medicines, stores, or equipments, not obtainable at the base hospital, be at once reported to the Principal Medical Officer. Medical officers in charge of hospitals will invariably render W.O. Form No. 152 (hospital stoppages) to the paymaster of the corps, at the the same time entering an abstract of them on the back of W.O. Form No. 184 when a soldier's disease has been induced by vice or misconduct.

In accordance with paragraph 697, section VIII., part 5, page 120, Revised Army Regulations, Senior Medical Officers of Division in the field will transmit weekly to the sanitary officer a report on the sanitary state of the troops, camps, and hospitals, and on all matters affecting the health and physical efficiency of the men.

42.
*Sanitary
Reports.*

Pharmacy and
surgery waggons.

The frequent complaints made by civil surgeons that the medicines they required were not in the field panniers, and their unwillingness to substitute one medicine for another; also the impossibility of carrying medicine chests on the march without their being injured, and the difficulty of getting reserve supplies of medicine packed in a convenient form for the field, induced me, when preparations for the Zulu campaign were being made, to recommend to the General that pharmacy and surgery waggons be supplied, but they were considered unnecessary. At a later period, however, an application to the home authorities was made, when they were sent out, but arrived too late for the campaign.

Field wallets.

The pack-horses provided being unable to carry the field panniers, it was found necessary to supply to each patrol a pair of field wallets, filled with such medicines, surgical material, and appliances as were required at the first dressing station.

Field rations.

The usual field ration was issued during the war, rice being used in lieu of vegetables only on the recommendation of the medical officer, and split peas and beans only when fresh vegetables were not procurable.

An early morning meal of $\frac{1}{4}$ oz. coffee, $\frac{1}{2}$ oz. sugar, and $\frac{1}{2}$ lb. bread was issued to the men who were under arms at daybreak.

Lime juice.

Lime juice 1 oz., with sugar $\frac{1}{2}$ oz., was issued daily when fresh potatoes could not be obtained.

Rum.

Rum, 2 oz. per man, was issued as a rule only on the certificate of the surgeon, but in the 1st Division it was issued regularly twice a week by order of the General.

Erbewurst.

A supply of this article was sent out for the use of the troops. It appears, however, to have been seldom issued, having been kept for a period of difficulty. No decided opinion, therefore, can be given as to its value as a substitute for groceries and vegetables when issued with the iron ration, but I am inclined to think that it cannot take the place of tea and coffee. It required to be well boiled, otherwise it was liable to cause diarrhoea.

Sanitary pre-
cautions.

The following sanitary regulations were published:—

On the march, when the heat is oppressive, the men should be allowed greater freedom about the neck by opening the tunic and shirt. Exposure to a hot sun without a helmet should be checked. The men should, when practicable, sleep under cover; on no account omitting to wear their cholera belts, the evil effects from any chill to the stomach or bowels being found to exceed all other risks in this climate. Company officers should be particular in ensuring personal cleanliness with their men, lice being quickly generated and spread, and opportunities should be sought for washing both persons and linen. The eyes should be freely bathed, and any indication of inflammation

at once brought to the notice of the medical officers. The men should be cautioned against drinking from stagnant pools or eating wild fruits. They should be encouraged to carry tea or coffee in their water bottles, thus ensuring the water being boiled before use.

Eating underdone meat or the internal organs of animals, such as kidneys, liver, or brains, being a fertile source of tapeworm, commanding officers should adopt precautions accordingly.

Alum was issued for use when the water was turbid.

Crease's filters were used in the larger field hospitals, but were found unsuitable for field service, as they would not stand the rough usage incidental to the march.

Means of purification of water.

Lipscombe's wicker filters were served out to the small field hospitals.

To the large base hospitals, such as Fort Pearson and Utrecht, large single or double barrel (charcoal) filters made in Pietermaritzburg were furnished.

For the troops barrel (sand) filters, made on the spot by the Royal Engineers, were provided.

In December the five columns originally intended were reduced to four, as follows:—

Military arrangements.

Lower Tugela, or 1st Column	- { 1/3rd Regiment, Naval Brigade, and 2 guns. 200 Mounted Infantry and 2,000 Natives.
Middledrift, or 2nd ,,	- 3,000 Natives.
Helpmakaar, or 3rd ,,	- { 6 guns R.A., 1/24th and 2/24th Regiments. 300 Police and Volunteers, and 200 Mounted Infantry.
Utrecht, afterwards called 4th Column	- { 6 guns R.A., 1/13th and 90th Regiments. Diamond Field Horse and 2,000 Natives.

The base hospital was established at Durban, this being the port of embarkation and disembarkation. In ordinary times the hospital consisted of only a barrack room converted into a ward. I therefore applied for the whole of the barracks, which were at once given up to the Medical Department, and the troops placed in tents. This gave accommodation for 60 patients, and formed a nucleus for an hospital of 200 beds.

Hospitals.

It was soon found, however, that this was not sufficient, and hearing that a building lately erected for a civil hospital at the Point, facing the beach, although completed had not been occupied, I applied to the Colonial Government for it. It was at once handed over, and was found in every way most suitable. The building consisted only of a basement story, with lofty and well-ventilated wards, and it was fitted with all the modern appliances requisite for a hospital. It accommodated from 90 to 100 patients, and, supplemented with marquees, could be expanded to 200 beds. This formed the auxiliary hospital. It was situated about two miles from the town, and had a railway running close to it, permission being given to stop the trains at the nearest point. It was open to the full influence of the sea breeze, and was mostly used as a convalescent hospital for those recovering from fever and dysentery.

A base hospital was also established at Pietermaritzburg, consisting of 140 beds. The hospital accommodation here at the commencement of the war consisted of an old Crimean hut and a brick building, which together supplied 58 beds. Another brick building was at once erected, and one side of the barracks—that contiguous to the hospital—was given over temporarily for the sick, doors being made in the wall facing the hospital. By this means 52 additional beds were obtained, another 30 being made up in marquees.

Base hospitals were also formed at Ladysmith, Utrecht, and Newcastle. At the former place the Dutch church, situated on an open spot in the centre of the town, formed the nucleus of an hospital of 150 beds. At Utrecht a number of wattle and daub huts were erected for 150 beds. At Newcastle the whole of the barrack huts, six in number, were given up for the use of sick and the convalescents drafted from Utrecht, the few duty men at the station being placed under canvas. These huts, with two hospital marquees, accommodated over 100 patients.

Another base hospital was established at Herwen, near Stanger, on the coast, for the sick of the 1st Division. It consisted of a commodious building belonging to a coffee planter, was situated on elevated ground not far from the sea, was cool and bracing, commanded a magnificent view on all sides, and with its verandahs enclosed could accommodate 100 sick; supplemented by marquees, this number was increased to 150. After the disaster at Isandhlwana, however, there was a threatened raid of the Zulus into the district, and the building was placed in a state of defence from the inside. This greatly curtailed the accommodation, and rendered the wards dark and dismal. Eventually, in the month of June the General Commanding the Division reported that he was unable to defend the place in the event of its being attacked when he made an advance into Zululand. It was therefore evacuated, and the base hospital was transferred to Fort Pearson.

Fort Pearson had long been occupied as a station, and had become a large camp; moreover, it overlooked a swamp. I consequently objected, but finding that the hospital must be located there to be under the defence of the guns of the fort, I gave way. Ten large oblong Zulu huts were now erected, and these, with marquees, gave hospital accommodation for 200 beds.

When the sick of this column increased so rapidly, and their transfer in large numbers to Durban threatened to choke the hospitals there, it became necessary to find means of relief. A convalescent dépôt was therefore formed at Pinetown, a comparatively cool and bracing spot, some 15 miles from Durban on the Pietermaritzburg road, and elevated 1,200 feet above the sea level, also situated on a line of railway. An officer of the 99th Regiment handed over his house and grounds rent free for the purpose, and the railway authorities gave permission for the trains to stop at the place both to put down and take up patients. The building itself was used for convalescent officers, whilst the soldiers were placed in Indian hill tents; accommodation being provided for 100.

Wynberg, near Cape Town, one of the healthiest spots in South Africa, was also utilised as a convalescent dépôt: the two large Crimean huts here being capable of accommodating 80 convalescents.

Besides the base hospitals mentioned the Station Hospital at Cape Town was used as such. It accommodated 130 patients, and assisted much to relieve Durban; invalids being transferred to it to await embarkation as opportunity offered.

Flying field hospitals.

Each regiment or corps was supplied with two bell tents for ordinary sick and attendants, with the proper supply of medical and surgical appliances and comforts, also extra blankets and cork beds.

Cacolets and litters.

At an early period a number of cacolets and litters were sent from England, but (as in the Cape Colony) were found too heavy for South African horses. In general the utmost these can carry for some distance is 160 lbs., whereas the weight of the cacolet or litter with pack saddle and two soldiers of 10 stone each would weigh 370 lbs. Pack-bullocks were then tried, but they were found to lie down with the load. On the arrival of a large number of powerful English horses belonging to the Army Service Corps, application was made for a certain number to use as pack-horses, but it was met with a refusal. Cacolets and litters were therefore not employed during the war except by the 17th Lancers.

Cetywayo's representatives meet the commissioners.

On the 11th December Cetywayo's representatives attended at the Lower Tugela, crossed over and met the Commissioners, when the award and final demand relative to the offenders in the violation of British territory were communicated to them. At the same time demands were made on the King for various reforms in his administration, for the performance of the promises he had made at his installation, and for the reduction of his army; a promise of compliance with these demands was required within 30 days from the date of demand. Such compliance would have required consultation by Cetywayo with his councillors, and therefore 10 days more were allowed for its consideration than had been given in the case of the demand for giving up the parties accused of violation of British territory; a demand with which he had it in his power to comply.

In the event of the demands for the sons of Serayo, and a fine of 500 cattle not being complied with by the stipulated date (1st January 1879), the General Commanding had been directed by the High Commissioner to move Colonel

Pearson's column across the Tugela Drift and to advance Colonel Wood's force from Utrecht across the Blood River.

On the 22nd December intelligence reached the Government that Cetywayo had summoned his regiments to the annual Umkosi dance at the Royal kraal, but not in the usual court dress. They were to leave their ornaments and badges behind them, and to appear with only their arms and ammunition, prepared for immediate active service. Killing on charges of witchcraft was reported as having recommenced in rather an ostentatious manner, as if to strike terror. Three kraals were said to have been "eaten up," the men, women, and children of the accused having been destroyed. Mr. John Dunn had received a message from the King, who had quite changed his tone, and now was determined to fight, as he said, from what he heard of the forces that were being sent against him, he could easily eat them up. On this Mr. John Dunn took the first opportunity of crossing the Tugela with his cattle, and offered the services of his well-armed Zulu followers to fight against Cetywayo.

Cetywayo summons his troops to the annual "mealie feast."

The General Commanding left Pietermaritzburg for the front on the 26th December, and made Helpmakaar his head-quarters.

Head quarters established at Helpmakaar.

On the 4th January 1879, two companies of Royal Engineers, the 2/4th and 99th Regiments, and drafts for the 1/13th, 2/24th and 88th Regiments arrived at Durban. One company of Royal Engineers and six companies 99th Regiment were at once sent to join the 1st column, one company Royal Engineers and three companies 1/24th to the 3rd column, five companies 2/24th to Helpmakaar Greytown, Pietermaritzburg, Stanger, and Durban being garrisoned by single companies of Imperial troops.

General reinforcements.

The line of advance described a crescent, of which one horn rested on Lunenburg and the other terminated at the Lower Drift of the Tugela. The 1st column occupied the latter position with its centre at Fort Pearson, an entrenched camp placed on the summit of a bluff overlooking the Tugela. The forces, encamped for several weeks previous at Thring's Post, had now been moved down to Fort Pearson. This column consisted of 1,500 Imperial Infantry, two 7-pounder guns drawn by mules, 200 Native Brigade, 200 Mounted Infantry, 200 Volunteers, and 2,000 Native Contingent, the whole numbering 2,200 Europeans and 2,000 Natives under the command of Colonel Pearson, of the Buffs.

Strength of the several columns

The 2nd column was stationed at Krantz Kop, near Fort Buckingham, where there was a concentration of troops in 1861. This is one of the most commanding heights in the country; it is almost inaccessible except on the Natal side, and from its summit the eye ranges over a great part of Zululand. Here was the 1st Regiment Native Contingent consisting of three battalions, two rocket tubes and 250 mounted Natives, in all 3,300 Natives, with 200 European officers.

The 3rd column was encamped at Helpmakaar and Rorke's Drift. The former is situated on high and open ground commanding wide prospects, its depôts were Greytown on the one side and Ladysmith on the other. There were with this column 15 companies of regulars, six 7-pounder guns, and a squadron of mounted Infantry, with mounted police, volunteers, and the 2nd Regiment Native Contingent, 2,000 strong, officered by 200 whites; in all about 2,200 Europeans and 2,000 Natives, under the command of Colonel Glyn, 1/24th Regiment.

The 4th column crossed the disputed Transvaal border, and rested on the line of the Blood River, with Utrecht for its base. It consisted of 1,600 regulars (including four 7-pounder and two other guns) and 300 mounted irregulars, all under the command of Colonel Wood.

The rainy season, very late this year, had now thoroughly set in; the weather was continuously wet; the roads had become heavy and slippery, so that the oxen could scarcely travel, and the difficulties of transport were thereby considerably increased and the passage of stores to the front was impeded. The number of oxen that died from overwork, want of pasture, and lung disease was incredible.

Rainy season sets in.

Cetywayo not having complied with the terms of the ultimatum, and the enforcing of them having been placed in the General Commanding's hands, the columns were ordered to invade the enemy's country.

Columns invade the Zulu country.

Colonel Wood's column crossed the Blood River on the 6th January, and encamped at Bemba's Kop, 35 miles from Rorke's Drift. A large force of Zulus, collected on his left flank and front, prevented him from moving, as he first intended, to take Usirayo's kraal in flank. This chief's kraal was situated in a strong position opposite Rorke's Drift, and he had 5,000 men with him.

Colonel Glyn's and Colonel Pearson's columns entered Zululand on the 11th and 12th respectively, and encamped without opposition. The Lower Tugela was crossed with some difficulty in consequence of the rapid currents.

No. 1 column advances towards Ekowe.

Colonel Pearson having established a Commissariat dépôt in an entrenched position on the left bank of the Tugela proceeded, with the majority of the troops of his division, as far as the Inyoni River on his way to Ekowe, where there was an English mission station, and where he was to remain and cover the coast road and Lower Tugela Valley from any inroad of the enemy in force.

No. 3 column attacks Usirayo's stronghold.

On the morning of the 12th, Colonel Glyn's column advanced on Usirayo's stronghold under the Ngutu Mountain and were immediately fired upon. The 2/24th and Native Contingent then stormed the place, and after a short and decisive engagement took it, the casualties being an officer and non-commissioned officer of Native Contingent wounded, two Natives killed and two wounded. 500 head of cattle were captured.

Move to Isandhlwana.

On the 20th No. 3 column broke up its camp on the left bank of the Buffalo River, and marched 10 miles towards the Indeni Forest, and encamped with its back to an isolated, precipitous-sided hill of peculiar appearance, called Isandhlwana.

On the second day following, at 2.30 a.m., Colonel Glyn, with six companies of 2/24th, four guns, and the mounted Infantry, left the camp, accompanied by the General, for the purpose of reconnaissance, leaving the following troops to guard the camp:—

Royal Artillery, 2 officers, 78 men, and 2 guns.
Two rocket tubes, 1 officer and 10 men (Durnford's force).
1/24th Regiment, 15 officers and 334 men.
2/24th Regiment, 5 officers and 90 men.
Mounted European Corps, 5 officers and 204 men.
Natal Native Contingent, 19 officers and 391 men.
Natal Pioneers, 1 officer and 10 men.
Lieutenant-Colonel Durnford's force, 18 officers and 450 men.
Total Natives, 851 men.
Total Europeans (including officers), 772.
Lieutenant-Colonel Pulleine, 1/24th, was in command.

Commandant Lonsdale reports that Isandhlwana camp is taken.

The enemy was seen several miles in advance, but retired before Colonel Glyn's force. The troops were then ordered to bivouac for the night, and the General started to return to Isandhlwana with the mounted men. When about six miles from the camp Commandant Lonsdale rode up and reported that it was in possession of the enemy. The whole of the force was at once brought back and an advance made with great speed towards the camp, which was not reached until after dark, when the worst fears were realized. It was deserted by the enemy, and was shrouded in the stillness of death. The force lay down amidst the debris of the plundered camp, and the corpses of men, horses, and oxen, fully expecting every moment to be attacked. Beyond a few alarms nothing occurred during the night, and at early dawn the following morning the troops were ordered to move off with all speed to Rorke's Drift, about which post there was some anxiety. There was no spare ammunition and only a few biscuits; a large portion of the force had had no food for 48 hours, had marched at least 30 miles the day before, and had passed an almost sleepless night on the stony ground. No one was therefore fit for prolonged exertion, and, moreover, it was felt that daylight would reveal a sight which would have a demoralizing effect upon the whole force. It was, therefore, determined to reach the nearest supply dépôt at Rorke's Drift as quickly as possible.

Post at Rorke's Drift seen in flames.

On sighting the post at Rorke's Drift dense smoke was seen to be rising from the house and Zulus to be retiring from it. All hopes of getting supplies appeared gone, and those at Helpmakaar (distant 12 miles) might have shared the same fate. To the great relief of the force on nearing the Buffalo River the waving of helmets was seen from inside the entrenchment, and it was now

found that the brave garrison, consisting of 80 of the 2/24th Regiment, some Volunteers, and Native Contingent, in medical charge of Surgeon-Major Reynolds, for 12 hours made a most gallant resistance against the attack of 3,000 Zulus.

It would appear that after the massacre at Isandhlwana the reserve of the Zulu force advanced towards Rorke's Drift. Notice of the disaster and that the Zulus were advancing was received at 3.15 p.m. The little garrison at once determined to hold the post at all costs, and set to work to loophole and barricade the store buildings and hospital, and to connect the defence of the two buildings. The hospital was a commodious structure surrounded by a verandah, and capable of accommodating 40 sick. There were in it at the time only 35. It had been selected as the base hospital of the column, and contained all the field equipment and medical and surgical stores left behind by the column. In little more than an hour the sound of firing was heard behind the hill to the south, and in a few minutes 500 or 600 of the enemy came in sight and advanced at a run against the south wall. They were met with a well-sustained fire which checked them. The greater number, however, without stopping made for the hospital, and after a short but desperate struggle were driven back with great loss. The main body of the enemy now came on, and taking advantage of some bush advanced under cover, and soon held one side of the wall while the garrison held the other. A series of desperate assaults were made, but repulsed with the bayonet. All this time the enemy had been attempting to force the hospital, and shortly after set fire to its roof. "The garrison of the hospital defended it room by room, bringing out all the sick that could be moved before they retired." Four privates of the 24th were the last to leave, holding the doors with the bayonet, their ammunition being expended. At this time Surgeon-Major Reynolds with conspicuous gallantry rushed from the hospital to the store building and brought back a supply of ammunition, having been exposed both going and returning to the cross fire of the enemy. From the want of interior communication and the burning of the house, it was impossible to save all; 5 of the sick were therefore massacred through not being able to move. When the building could be held no longer the garrison retired to the store, the roof of which the enemy were trying to fire. As darkness came on the post was completely surrounded, and the garrison was forced to retire to the middle, a position which was retained to the last. Several assaults were made and repulsed, the vigour of the attack continuing until after midnight. About 4 a.m. the firing ceased, and at daybreak the enemy were out of sight.

350 of the enemy were killed.

The total number of the garrison was 8 officers, 96 non-commissioned officers and men, and 35 sick.

The casualties were: killed, 1 officer, 13 non-commissioned officers and men, and 1 native; wounded, 12—2 afterwards dying.

There were 3 men of the Army Hospital Corps doing duty in the hospital who all behaved bravely.

Of the force in the camp, a few mounted men only managed to escape and swim the river. Our loss was, therefore, 30 officers and 500 non-commissioned officers and men of the Imperial troops, 21 officers and 70 non-commissioned officers and men of the Colonial forces, with 300 Native Contingent. Amongst the slain were Surgeon-Major Shepherd, Lieut. and Acting Surgeon Boué, of the Native Contingent, and Lieut. of Orderlies Hall, and 8 men of Army Hospital Corps. A large quantity of hospital equipment, medical and surgical stores, and 6 ambulances were captured.

Extreme excitement was caused by this disaster; its effects were shown by the country people throughout the Natal Colony rushing into the nearest laager, and all the towns were placed in a state of defence. Not only were the European colonists in a state of alarm, but a similar effect was produced upon the native mind, and desertions from the Native Contingent were numerous. Native servants left their employers in great numbers and returned to their kraals, and fears were entertained of a rising of the Natal Zulus.

Further reinforcements were at once asked for from England; viz., 2 British regiments of infantry, 2 cavalry regiments, and 1 company Royal Engineers.

No. 1 (Colonel Pearson's) column arrived at Ekowe on the 23rd January having on the previous day been attacked on the north side of the Inyezane

Defence of
Rorke's Drift.

Our loss at
Isandhlwana.

Excitement and
alarm throughout
the Colony.

More troops
demanded.
Attack on Col.
Pearson's
Column at
Inyezane.

river by the enemy. The engagement commenced at 8 a.m., lasted one hour and a half, and ended in the flight of the Zulus.

The casualties were: killed, 2 privates 2/3rd Regiment, 2 officers, 8 non-commissioned officers and men Native Contingent; wounded, 6 privates 2/3rd, 1 sergeant 90th (mounted Infantry), 1 private 2/24th Regiment, and 1 lieutenant and 8 men Naval Brigade.

Loss of the enemy upwards of 300 killed, the wounded were all carried off except 2.

Wood's flying column surprises a small body of the enemy.

On the 24th Wood's flying column came across a party of the enemy between the Zingen Nek and the Ityenteka Range, and dispersed them, killing about 50.

Hearing of the disaster at Isandhlwana Colonel Wood now retired towards the Umvolosoi river in a position to cover Utrecht.

It is determined to hold Ekowe.

Colonel Pearson now determined to hold Ekowe, and to send all the mounted men and 2 battalions of Native Contingent to Lower Tugela so as to have more food and accommodation for the rest of the garrison.

Ekowe was an English mission station situated in an elevated and healthy position, there being good water outside the fort and close under the guns.

The garrison consisted of 6 companies 2/3rd Buffs, 3 companies 99th, Naval Brigade (128), 2 7-pounder guns, 1 Gatling, 1 rocket tube, Royal Artillery (23), 2 7-pounder M. L. guns, No. 2 company Natal Native Pioneers.

Attack on Fort Tenedos.

On the night of 25th an attack was made by the Zulus on Fort Tenedos, but on a heavy fire being opened on them they retired. No casualties on our side.

Scare at Stanger and along the coast to Durban.

At this time I was on my way to the Lower Tugela, and had got as far as Stanger when a report arrived that the Zulus had crossed the river and were pouring into the Colony at this point. The whole district was soon in a state of alarm, the Colonists leaving their houses and fleeing into laager. Herwen base hospital, under these circumstances, was considered in great danger; and orders being given by the commandant for its immediate evacuation the patients were hastily removed at 6 a.m. with as much hospital equipment as the ambulances could carry in addition to them, and brought to Stanger, where they were placed in marquees.

The camp which was about a mile from Stanger was brought in to protect the commissariat stores, a large portion of which was used to form barricades, and the whole town was put in a state of defence.

Being unable to continue my journey to Fort Pearson I returned to Durban. All along the road I found the houses deserted. Durban was full of refugees, and several of the inhabitants fled on board ship for safety.

It afterwards turned out to be a false alarm. The Zulus had not crossed the Tugela, but had only been seen in large numbers on the other side. Their repulse at Fort Tenedos had no doubt prevented their invading the Colony.

Volunteers relieve the 88th Regiment at King William's Town.

The Government of the Cape Colony now sent 300 volunteers to King William's Town, which set free the 88th Regiment for duty at Natal.

The Zulu army after being doctored at the King's kraal again take the field.

The Zulu army having returned after the capture of Isandhlwana camp to the King's kraal, there to be doctored with charms taken from the slain of the 22nd January, again started to attack the columns of Colonels Pearson and Wood, and possibly to make raids into the Colony.

Notwithstanding their victory at Isandhlwana, it was asserted by Zulu refugees that their force was much shaken by the loss sustained there, that there was a strong feeling of alarm pervading the nation, and that they were specially disheartened by their losses at Rorke's Drift.

The Zulus now hovered round Ekowe, which was strongly entrenched and provisioned for two months.

By the arrival of the three companies 88th Regiment from King William's Town the two companies of the Buffs were enabled to be removed to Forts Pearson and Tenedos on the Lower Tugela.

In consequence of the crippling of the 2nd and 3rd columns, and the shock which had been given to the Colonial forces, the 1st and 4th columns were obliged to suspend their advance and await reinforcements from England.

The head quarters of Colonel Glyn's column after strengthening Rorke's Drift fell back on Helpmakaar.

On the night of the 10th February Umbeline accompanied by Manyanyoba and about 1,500 men attacked the Wagner mission station, about 4 miles

from Luneberg, and massacred men, women, and children, burning the native Christian huts and seven children alive, and mutilating the bodies of many of the women and children.

At daylight they made off for Manyanyoba's caves with several hundreds of cattle and thousands of sheep. A patrol came up to the enemy just as it had succeeded in crossing the Pongolo River. On the same day Colonel Buller with a patrol party left Kambula camp for Zlobane mountain, about 12 miles distant, and captured 500 head of cattle, but being met by about 500 Zulus strongly posted on the summit he was obliged to retire. Loss of enemy 10—one man on our side being badly wounded.

With the exception of a pair of field panniers at Helpmakaar, the whole of the medicines, &c. of Colonel Glyn's column had been lost. A few medicines in small quantities were at once obtained by purchase from the mission station at Umsinga, 12 miles off, and a liberal supply of medicine, medical and surgical stores was without delay despatched from Pietermaritzburg by the shortest route; yet they did not reach their destination for nearly six weeks, owing to the ox waggons (the only transport available) being obliged, after they had gone nearly half-way, to return and go by another route. Some indispensable medicines, such as quinine and pulvis ipecac, were forwarded by post, and some others by native runners; but 2 lbs. of the former failed to come to hand, having been stolen on the way.

Medicines, &c.
of Col. Glyn's
Column.

In the middle of February fever made its appearance at Helpmakaar and Rorke's Drift. Immediately after the disastrous affair at Isandhlwana, these two important strategical positions were hurriedly placed in a more secure state of defence, and revetments were extemporised with sacks of mealies. The garrison, both European and native, were now crowded together without tents or shelter, excepting that afforded by a few tarpaulins. Over 1,000 men were at Helpmakaar exposed to cold and rain, some sleeping on wet mealie bags, others on the damp ground, their nights sleepless from constant alarms, and subjected to the noxious exhalations given off from decomposing grain and a soil saturated with urine. The danger from rotting grain and mealies was frequently represented to the local military authorities, but to little purpose, military necessity ruling paramount. Under these unfavourable conditions a low vital tone quickly supervened, indicated by malaise and loss of appetite, the young and weakly men being soon attacked with fever, diarrhoea, and dysentery.

Prevalence of
fever at Help-
makaar and
Rorke's Drift.

Considerable difficulty appeared to attend the official designation of the fever. Certain anomalous symptoms were present and of so mixed a character as to stamp it a special type of disease. While some medical officers reasoning from the more prominent symptoms of high temperature, diarrhoea, Sordes typical tongue, and the post-mortem appearance of ulceration of Peyer's patches, would infer that the disease was enteric fever, others would assert that the type of disease differed essentially from true enteric, and presented more of the mixed character of enteric and bilious remittent, basing their diagnosis on the absence of roseola spots, the daily evacuations, and remissions of temperature, the bilious stools, and gastric and hepatic derangement. A marked feature observed in this fever was the hyperœmic condition of the entire alimentary mucous tract, indicated by congestion of the throat and fauces, the excessive secretion of mucus, the copious mucous diarrhoea accompanied by tenesmus and followed after straining by a little pure blood. These latter symptoms, as Surgeon-Major J. H. Hunt observes, would seemingly point to fungoid poisoning by the decomposing mealies.

Type of fever.

Another symptom present was the absence of co-relation between the pulse and temperature. This symptom would also seem to partake in many respects of the "mucous fevers" of the older writers, of enteric fever and bilious remittent fever.

The fort at Rorke's Drift was similar in many respects to that of Helpmakaar, there being the same overcrowding, excessive fatigue, exposure to the cold and rain, and to the emanations from fermenting mealies, and want of sleep, inducing a depressed condition of the vital powers highly favourable to the invasion of febrile attacks. Its sanitary condition, however, was not so bad as that of Helpmakaar, and fever was less prevalent. Surgeon-Major Reynolds states the fever to be essentially bilious remittent, characterised by bilious vomiting, hepatic congestion, and delirium. The peculiar mucoid

character of the stools, congested pharynx, and excessive mucous secretion from the throat were remarkable symptoms of the fever at this post also.

This reminds me that the fever designated generally as "typho-malarial," so prevalent at the several outposts during the Galeaka-Gaika campaign, nearly always commenced with sore throat, whence it would appear that the two fevers originated from similar causes.

Although there appeared to be an absence of swamps in the vicinity of Rorke's Drift and Helpmakaar, yet the ground at the bottom of the valleys and along the course of streams was so swampy as to be impassable on horseback, this especially being the case after rains.

Malarious fevers are alleged to be very prevalent among the natives of this district.

Evacuation of
Helpmakaar.

The unhealthy state of the garrison of Helpmakaar rendered the evacuation of that post imperative. The 2/4th and detachments 1/13th Regiments were therefore sent to Utrecht, and the 2/24th and Natal Carbineers to Dundee.

Enteric fever
at Utrecht.

Immediately after the arrival of the Helpmakaar contingent at Utrecht an epidemic of enteric fever broke out. The medical officer in charge of this station reporting on this outbreak says, "92 cases of enteric fever were admitted into the base hospital, 65 cases were furnished by the 2/4th and detachment 1/13th Regiments, which had recently arrived from Helpmakaar; 31 of these cases being admitted directly after their arrival between the 21st and 28th February, 21 in March, 7 in April, 3 in May, and 3 in June. The admissions from the other troops at Utrecht and Balte Spruit took place subsequently to those mentioned, although their strength exceeded that of the new arrivals." This clearly proves that the disease was imported by these regiments.

Some obscurity still appears to attend the type of the disease as it occurred at this post. The same medical officer alludes to it as follows:—"By whatever name this species of fever in South Africa may be designated, and though as usual enteric fever was not always diagnosed immediately on admission, careful examination of cases of simple continued fever and febricula soon enabled the medical officers to recognise some of them as true enteric fever."

Undoubtedly, whatever may have been the nature of the disease, bilious remittent, or enteric, whether the disease remained latent among the troops from Helpmakaar, manifesting itself on arrival, or whether it was contracted by drinking impure water on the line of march between the two places, still it is important to notice that such potent factors as overcrowding, an insanitary town, and a march were present, and that the epidemic influence comparatively absent the preceding and subsequent months was most intense during February and March. It is a well known fact, which must not be lost sight of, that these months are recognised in the district as the "sickly season" for men, and the period when epizootic diseases are in full operation among horses and cattle. This period corresponds to our autumnal months, the rains begin to cease, and owing to the subsidence of the subsoil water, and the drying up of swampy localities, the malarious influence is most intense.

The medical officer in charge further writes that "it is highly probable that the noxious emanations from the soil, decomposing animal and vegetable matter, and the presence of a large marshy tract, combined together to produce a deleterious or poisonous condition of atmosphere."

Fever at Dundee.

Fever of a similar type also occurred at Dundee at the same period. It was undoubtedly introduced by the Natal Carbineers, who suffered severely from fever at Helpmakaar, and were the first corps to occupy this new station. The 2/24th afterwards suffered from it but not to a serious extent.

Fever at Forts
Pearson and
Tenedos.

At Forts Pearson and Tenedos on the Lower Tugela, fever of the enteric form likewise made its appearance at this time. But taking into consideration that the regiments of Native Contingents (whose filthy habits are proverbial) were encamped at these posts, and its being the unhealthy season, with extreme heat and occasional heavy showers during the day and sultry steamy nights, this was to have been expected.

News from
Ekowe.

On the 9th March a messenger from Colonel Pearson (who it appears had received none of the messages sent him by the general) arrived at Lower Tugela, and communication by flashing signals was now established. Colonel

Pearson stated that the garrison generally was in a sickly condition, and that any relieving force should bring a convoy and be prepared to fight.

Horse sickness having broken out at the Lower Tugela, the horses were removed to St. Andrew's mission station, an elevated position four miles from Fort Tenedos. The station was entrenched and occupied by two companies 2/3rd Buffs, two squadrons mounted Infantry, and mounted Native Contingent.

St. Andrew's mission station occupied.

Reinforcements from England now began to arrive (the 57th Regiment from Ceylon having disembarked at Durban on 11th March), the 91st reaching Durban on the 19th, and the 3/60th Rifles Cape Town on the same day.

Reinforcements from England.

The Naval Brigade was also augmented from H.M. ships "Shah" and "Boadicea." All these reinforcements were pushed on to the Lower Tugela, and formed a portion of the relieving force for Ekowe, which consisted of sailors and marines of the "Shah," "Tenedos," and "Boadicea," 2/3rd, 99th, 57th, 3/60th, and 91st Regiments, two squadrons mounted Infantry artillery, and native details, mounted and foot.

Relieving force for Ekowe.

Two cavalry regiments, 1st Dragoon Guards and 17th Lancers, also arrived from England and were at once sent up country, as the coast line was not suitable for English horses.

Two cavalry regiments arrive and are sent up country.

After the events of 22nd January the necessity for more mounted men was recognised, and a corps was raised as quickly as possible at Cape Town, and on arrival in Natal sent to strengthen the lower line.

Of the six and a half battalions of native contingent, all but two battalions deserted on or after the 22nd January, and these had not been engaged with the enemy. Two battalions more were ordered out by the lieutenant-governor, making four battalions now under arms.

Desertion of Native Contingents and hospital cot bearers.

The hospital cot bearers of Colonel Glyn's column deserted at the same time as the native contingent, and they were replaced only with great difficulty.

Confidence had begun to return, especially as the news of the arrival of reinforcements spread through the Colony, when the report of the destruction of a detachment of the 80th Regiment under Captain Moriarty by the Chief Umbeline renewed the alarm in the Utrecht and Newcastle districts. It appeared that a convoy, under escort of 104 men were on the way from Derby to Luneberg, and while waiting to cross the Intombe River, which was swollen, were attacked before daybreak by about 9,000 Zulus. They killed the sentry and were amongst the troops before they could rally and get their arms. Captain Moriarty, Civil Surgeon Cobbin, and 61 rank and file were killed, the remainder managing to save themselves by swimming across the river.

Disaster at Intombe River.

Of the Colonial troops, the following were actually effective on 16th March :—

Frontier Light Horse and Baker's Horse	-	-	471
Weatherley's Horse and Kaffrarian Rifles	-	-	222
Natal Mounted Police and Carbineers	-	-	93
Other mounted volunteers	-	-	581
Native levies	-	-	5,769
Europeans attached to latter	-	-	495

Irregular troops actually effective.

On this date the following message was signalled from Ekowe, "Short rations until 3rd April, bread stuff until 4th. plenty of trek oxen;" on which it was determined to relieve the garrison as soon as possible. Other messages arrived on the 26th reporting 120 sick, and that medicines were required. These were at once despatched by runners from Fort Pearson.

Messages from Ekowe.

No doubt the scarcity of rations, the want of proper sleeping accommodation, and the hard work to which the troops were subjected, necessitated by their position, led to the sickness breaking out—to such an extent that 20 deaths had occurred. The church, which was occupied as an hospital, was crowded to repletion, this with absence of news from the outer world, save that thousands of Zulus lay between the beleaguered garrison and the Tugela, tended to depress the spirits and cause a low vital tone.

On the 29th the column started for the relief of Ekowe. It comprised two divisions of the following strength:—1st Division: whites, 1,660; blacks, 1,480; total, 3,140, with two guns, 9-pounders, two rocket tubes, 24-pounders, one Gatling gun. 2nd Division: whites, 1,680; blacks, 800; total, 2,480, with two rocket tubes, 24-pounders, and one Gatling gun. The transport consisted of 44 carts and 94 wagons, including three ambulances. No tents were taken, with exception of three bell tents for the hospital; no other

The relieving column starts for Ekowe.

hospital equipment; no groceries. The force was commanded by the lieutenant-general.

Battle of
Ginginlovo.

Large numbers of the enemy gathered on the hills around as the troops advanced, but they kept at a safe distance until the morning of the 2nd April, when at daybreak, while the camp was in laager, an attack was made in force, the number of the enemy being estimated at from 8,000 to 10,000. The fire from the line, the big guns, and the Gatlings was so effective that the enemy soon became disorganized and fled, leaving 1,000 dead. Our casualties were—killed, 1 officer, 4 men (whites), 5 men (blacks); wounded, 5 officers, 2 severely, and 30 men, 16 dangerously, 4 severely (whites), 27 men (blacks), 10 dangerously.

Sixteen of the enemy that had been wounded severely were brought into laager, and received food and medical assistance. Amongst the dead Zulus were several clothed in the accoutrements of the 24th Regiment, and one was wearing the sword of an officer. On the following day (3rd April) a portion of the force was left as a garrison for the laager at Ginginlovo, and the remainder carrying three days iron rations and escorting 58 carts of stores moved off in compact order for Ekowe. The distance was 15 miles, but as deep streams and heavy swamps had to be traversed, and there were steep ascents in the road, the force did not reach Ekowe until 11.30 p.m.

Relief of Ekowe.

After halting one day the relieving force left Ekowe, taking with it the garrison, which at night encamped, whilst the former bivouacked.

On the morning of the 6th, at 3.30, there was a scare, during which five men of the 60th Rifles and nine of the native allies were wounded whilst attempting to gain the shelter of the laager; three afterwards died of their wounds.

When the force reached Ginginlovo on its return, the camp was moved one mile nearer the coast, and the sick and wounded were sent into Fort Pearson in charge of Surgeon-Major Tarrant.

The Ekowe garrison marched by easy stages to Fort Pearson, and arrived on the 8th. The men on arrival looked weak and anæmic, but none of the sick were in such a serious state as to give one the idea of their having undergone such privations and hardships.

The worst cases of the sick and the wounded at Ginginlovo were at once despatched to Durban in 12 ambulances. In addition to these, 5 officers and 40 men were sent to Herwen hospital. Altogether there were 100 sick, including 8 officers, brought away from Ekowe.

When I found that the relieving column was about to start for Ekowe with only three bell tents for hospital purposes, it was submitted that a field hospital of 50 beds should accompany it, but this was not entertained as the column had to march as light as possible. The sick and wounded at Ginginlovo were, therefore, without sufficient tents for some little time until, in fact, a field hospital could reach the camp. However, five additional tents had been left behind by the Ekowe garrison, and in the meantime other shelter was improvised by tarpaulins thrown across the disselbooms (poles) of the ox waggons.

Affair at Zlobane
mountain.

On the 28th March Lieutenant-Colonel Buller having heard that there were a large number of cattle on the table land on the summit of the Zlobane mountain made an attack on it with his mounted force of 500 men and about 850 irregulars. Surgeon-Major O'Reilly reports on this action as follows:—

“Lieutenant-Colonel Buller, C.B., with 300 mounted men and 850 irregulars ascended the eastern side of the mountain before dawn, while Lieutenant-Colonel Russell with 200 mounted men ascended the western side. Civil Surgeon Conolly accompanied Lieutenant-Colonel Buller's party, Civil Surgeon Jolly that of Lieutenant-Colonel Russell. Each surgeon had with him a pack horse and surgical wallets. There was some fighting on ascending the mountain, and several officers and men were killed. The top of the mountain, a very large open space, was reached by the mounted men, while the native irregulars captured in the bush at the sides about 3,000 head of cattle. So far the affair was a success. Just, however, as the mounted men on the top of the mountain were about to descend an enormous Zulu army was seen quite unexpectedly below, advancing so as completely to surround the mountain and cut off retreat. A panic now seems to have seized upon the men, and they

frantically endeavoured to escape by leading their horses down the precipitous cliffs and stony krantzies of the mountain side. The Zulus on the top, who had hitherto remained concealed among the rocks and in the caves, seeing the panic stricken condition of our men now rushed down from all sides and shot and assailed numbers of horses and men. Many of the men on reaching the base of the mountain having lost their horses were overtaken and killed by the advancing Zulu army below. All this occurred on the western face of the mountain, the one nearest to Kambula camp. Meanwhile, Colonel Weatherley and Captain Burton with about 80 men went back down by the eastern side of the mountain to try and recover the body of an officer who had fallen early in the day. When they got to the foot of the mountain they found themselves surrounded by over 10,000 Zulus. A rush was made through the dense masses of the enemy, but only eight escaped.

"The behaviour of Civil Surgeons Jelly and Conolly on this disastrous day was from all accounts beyond all praise. They were the last in the retreat back to the camp when pursued by many thousand Zulus, and they frequently dismounted to assist wounded and helpless men at their own imminent risk."

The pack horse with the surgical wallets, which contained among other things a case of surgical instruments, rolled over a precipice, and everything was lost.

Thirty hammock bearers with 20 ordinary field stretchers accompanied the parties. Of these only 25 returned to camp, five being killed. The behaviour of these men by all accounts was admirable. Only six stretchers were brought back; under the circumstances it was a marvel that they were not all thrown away.

The casualties on our side were—Regulars: killed, 3 officers; wounded, 1 man. Irregulars: (white) killed, 11 officers and 77 men; wounded, 8 men; (black) not known.

On the following day (29th March) the camp of Colonel Wood's column at Kambula was vigorously attacked by four Zulu regiments. About 11 a.m. dense masses were seen approaching to Zlobane mountain near the Umvolosi. Two companies that were out wood cutting were recalled and the cattle were brought into laager. At 1.30 the enemy reached the camp and spread out in the usual Zulu manner, the great wings or horns encircling it. The attack lasted until 5.30, when the enemy fled, and Colonel Buller with his mounted men were ordered out and pursued for seven miles, killing great numbers, the Zulus being too much exhausted to fire in their own defence.

Attack by Zulus
on Kambula
Hill camp.

The loss of the enemy must have been very heavy, the killed alone were estimated at 1,200, and a very large number must have been wounded. 800 dead bodies lying close to the camp were collected and buried. From information given by prisoners the Zulu army was 25,000 strong, of whom 16,000 were actually concerned in the attack. One company of the 90th Light Infantry suffered very severely, losing 2 officers and 10 men.

The troops that took part in the engagement on our side were: 11/7 Royal Artillery, 2 guns; mounted train, Royal Artillery, 2 guns; 1/13th and 90th Regiments; 85 mounted infantry, and about 450 colonial and native forces.

Wood's native irregulars deserted en masse after the affair of the previous day at Zlobane mountain, and took no part in the engagement.

Civil Surgeon Jolly with two orderlies, Army Hospital Corps, was with the garrison in the fort during the attack, and rendered valuable aid to the wounded there. Surgeon-Major O'Reilly, Surgeons A. L. Brown and Thornton, Civil Surgeon Conolly, and Hospital Dresser Armitage remained at the field hospital in the camp. The field hospital from its position was exposed to a severe cross fire, most of which fortunately passed over head, but several of the hospital tents were struck by Zulu bullets.

Surgeon-Major O'Reilly reports, "Surgeon A. L. Brown and Thornton, and Civil Surgeon Conolly laboured hard during the whole engagement attending to the numerous wounded, by whom our resources were severely taxed. An amputation of the upper arm was performed by Surgeons Brown and Thornton in a very exposed part of the camp during the hottest part of the fight." Colonel Wood in his despatch after the battle says, "The wounded were cared for most promptly by Surgeons O'Reilly, L. Brown, and staff generally under fire."

The casualties on our side were—Regulars: killed, 13 men; wounded, 7

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officers and 50 men. Irregulars: killed, 2 men; wounded, 1 officer and 6 men. Natives, 4 wounded.

Nursing sisters
and lady nurses.

Early in the war two sisters of charity at Pietermaritzburg offered their services and were employed at the station hospital there for some time until, in fact, other lady nurses arriving they resigned.

At Ladysmith, also at an early period of hostilities, three sisters of the community of St. Michael and All Angels, who had been kindly lent by the Bishop of Bloemfontein, were of the greatest assistance; they earned the praise of every one by their self-devotion and unremitting attention to the sick and wounded.

At a later period the sisters of All Saints at Cape Town offered their services and were accepted, their sphere of usefulness being confined to Durban and Pinetown where they did excellent work.

Towards the close of the war the Stafford House committee sent out a party (7) of lady nurses in charge of Surgeon-General Ross, C.I.E., these were employed at Durban, Pietermaritzburg, Ladysmith, Newcastle, and Utrecht, where they were of great use and their services were much appreciated.

Frontier guard.

These were closely followed by a staff of nursing sisters from Netley, in charge of Mrs. Deeble, under whose able superintendence they did excellent service; their duties being performed most zealously and efficiently, and their example of devotion to their duty having a most beneficial effect upon the orderlies of the Army Hospital Corps. These nurses were employed at the large base and auxiliary hospitals at Durban, at Pietermaritzburg, Newcastle, and Middleburg.

The frontier was now guarded from the mouth of the Tugela to Rorke's Drift, with exception of one post (Greytown) by natives, while the line from Rorke's Drift to Luneburg was defended by British troops. The posts were as follows:

Troops in
position.

Fort Pearson, Fort Tenedos, Stanger, 1 company each; Thring's Post, 120 volunteers and 2,000 natives; Fort Cherry, 1,300 natives; Hermansberg, 60 volunteers; Greytown, 2 companies; Umsinga, 2,000 natives and 1,000 border guard; Helpmakaar, 120 Natal Mounted Police; Rorke's Drift, 3 companies; Dundee, 4, and Landtman's Drift 1 company 2/24th; Conference Hill, Balte Spruit, Utrecht, 2 companies each; Luneburg and Burgher's Laager, 1 company each.

On the 14th May all the reinforcements demanded after the disaster at Isandhlwana had arrived, and the troops were in position, only waiting for supplies and transport to advance.

Camp at Ginginlovo shifted
to Fort Chelmsford.

The force was now reformed into the 1st and 2nd Divisions, commanded respectively by Major-Generals Crealock and Newdigate, and a Flying Column by Brigadier-General Wood. The troops at Ginginlovo were placed under the command of Brigadier-General Clarke, and became the 2nd Brigade of the 1st Division; and those at Fort Pearson under Brigadier-General Pearson, consisting of the 2/3rd, 88th, and 99th Regiments, became the 1st Brigade.

The camp at Ginginlovo was for sanitary reasons soon shifted to an advanced position four miles nearer the coast, and on more elevated ground. A more permanent fort was now built, which was named Chelmsford, with a field hospital of 75 beds. The site, although good for strategical purposes, was not so in a sanitary point of view; it was surrounded on nearly every side by marshy ground, and had the Inyezane flowing on three sides of it at a distance ranging from 200 yards to half a mile. Except during the rains this river is only a sluggish stream, running through reeds and rushes in every stage of decay; it supplied the water for dietetic purposes, there being no other available, consequently it was of indifferent quality except when the river was swollen.

When the troops first arrived here, and for some little time afterwards, it was found that the water was impure, being impregnated with organic matter both animal and vegetable. On searching for the cause of the former some dead Zulus were found lying in the river, and from time to time the carcasses of cattle; these animals, when affected with lung disease, so common in the country, always make for water when about to die, which accounts for so many dead oxen being found in or near rivers. The soil on which the fort stood consisted of reddish clay, which after rain became thick tenacious mud. The Native Contingent were quartered in the immediate vicinity, and their camp was never in a good sanitary state. The duties and fatigues of the

troops were excessive whilst constructing the new fort, and the convoys to and from Fort Pearson during the period of laying in the two months' supplies were constant and most trying.

As was to have been expected under such circumstances the sickness increased, diarrhoea, dysentery, and fever, became prevalent. The Senior Medical Officer was of opinion that the fever was due in great measure to the turning of the soil in making the fort. The 57th, one of the regiments quartered here, had only just come from Ceylon, where it had been five years, many of the men having suffered from fever. The other regiments, the 60th and 91st, were mostly composed of young soldiers who were physically incapable of undergoing the fatigue and exposure to which they had been subjected. These regiments, as also the 57th, on landing at Durban were at once pushed on to the Lower Tugela to form the Ekowe relief column, and it being near the close of the rainy season, when rain falls nearly every day, they landed, they marched, they fought in the rain, their clothes were continually wet, their general health suffering in consequence.

Sickness at Fort Chelmsford.

Quinine was administered three times a week to all the weakly men, and the drinking water was as far as possible boiled before use, filters being also provided. But the necessity for removing the sick from such a place was at once recognised, and orders were given that they should not remain longer than necessary, and arrangements were promptly made to draft them off twice a week to Fort Pearson, thence to Durban. In one week 210 sick men were transferred to the Lower Tugela, many of the cases, however, were simple cases of fever and debility which soon recovered.

Orders were issued that all weakly men should be sent away from the front and kept to guard the rear of the division.

The arrival of such large and frequent convoys of sick and weakly men at Fort Pearson, together with the increasing sickness in the division generally, soon filled the hospital. The 200 beds which were at first sufficient had to be increased, and other provisions made to empty the hospital, so that it should be ready for the reception of wounded from the front. For this purpose 10 English ambulances with mules were employed, with resting places at Stanger, Compensation Flats, and Verulam, each being supplied with three hospital marquees, and bell tents for offices, &c. in charge of a non-commissioned officer of the Army Hospital Corps.

Arrangements for emptying Fort Pearson hospital.

By this means upwards of 100 sick were often brought down at a time to the general base hospital at Durban, taking four days on the journey. The distance between Fort Pearson and Durban was 70 miles, but the ambulances only came as far as Saccharine, the terminus of the railway, which was 15 miles from Durban, and five from Verulam. At Saccharine there was accommodation for the sick whilst waiting for the train to convey them to Durban, and at the station a railway van, specially fitted with eight stretchers for the serious cases, was always in readiness. The upper tiers of four stretchers were slung by means of vertical spiral springs similar to those used by the Order of Saint John of Jerusalem.

Turning northwards to the 2nd Division and Flying Column. A station was now established at Balte Spruit, 16 miles south-west from Kambula, with a field hospital of 25 beds for the reception of the sick from Kambula en route to Utrecht. A similar field hospital was also formed at Doornberg, where the cavalry and infantry were assembled under Major-General Newdigate. A station hospital had already been formed at Dundee, situated about 20 miles from Doornberg, and midway between it and Ladysmith, it consisted of 50 beds. At Ladysmith was the base hospital of the 2nd Division, as before stated the Dutch church formed its nucleus, and this, supplemented by hospital marquees, accommodated 150 patients. Newcastle, 70 miles north of this, had originally only a small hospital of 12 beds, but these were now increased to 50 and shortly afterwards to 100, in order to form a convalescent dépôt to relieve Utrecht, which was the base hospital of Wood's Flying Column, and was distant 25 miles in an easterly direction. At a later period of the war the hospital at Newcastle received the less serious cases of the sick and wounded from the 2nd Division.

Posts with field hospital, 2nd Division.

At the beginning of May the rains, which had not been so heavy as usual, ceased, and the weather though still very hot during the day was cold at night. It was hoped, therefore, that sickness would abate; as far as Help-

Rainy season closes.

makaar and Rorke's Drift were concerned this was the case, but at Utrecht fever of an enteric type still prevailed. At the Lower Tugela and Fort Chelmsford also the troops continued to suffer much from fever, diarrhoea, and dysentery, although every precaution was taken as to sanitary and preventive measures. No doubt the prolonged stay on the same spot, with the same monotonous convoy duty, and also occupying the same camp (with the Native Contingent so near) for so long a period, tended in a great measure to keep up the sickness.

Increase of posts. I now found that it was the intention to form a chain of posts about 12 miles apart along the lines of communication in the enemy's country. Previously, in consequence of the paucity of troops, it was intended to cut off all communication with the base as the troops advanced. This necessitated an increase of medical officers, as the splitting up of the forces in such a manner was never contemplated. In addition to the posts along the line of communication, the chain of stations along the frontier, with few exceptions, required medical officers. A telegram for 20 more surgeons was therefore at once forwarded to England via Madeira.

Hospital orderlies. For the same reasons there was also at one time a want of men of the Army Hospital Corps, and regimental orderlies, and convalescents were employed as hospital orderlies. At the commencement of the war the strength of the Army Hospital Corps was 124 of all ranks. In March and April a draft of 143 arrived; in July, 115; and in August, 52.

Quinine. An enormous amount of quinine was consumed, especially on the coast line, and it was found necessary to apply to England for a supply of 10 lbs. to be sent out by each mail steamer, until a maximum of 50 lbs. was attained, which was done.

Onward movements. On the 28th May the King's Dragoon Guards moved from Doornberg to Koppie Allein 12 miles distant, on the Blood River. The next day the 2nd Division with Lord Chelmsford followed, and after a day's halt the whole, with exception of the right wing of the King's Dragoon Guards, left behind to guard the rear, moved on to the Incenci mountain, being joined here by Wood's Flying Column.

Surprise and death of H. I. H. Prince Napoleon. Prince Napoleon left the camp in the afternoon of the 1st June on a reconnoitring expedition, accompanied by an officer of the staff, and an escort of 12 of Bettington's Horse. When about 10 miles out they halted and off saddled in a mealie field in close proximity to a kraal. The Prince having done his sketching, orders were given to on-saddle, and the party were in the act of mounting their horses when a volley was fired from among the mealies; this frightened the horses, and the Prince's being a spirited animal he was unable to mount, and being left behind, was killed. His body was recovered next day, and after undergoing a process of embalming, as well as circumstances would permit, was carried in an ambulance to the rear for the purpose of being sent to England.

Cavalry skirmish. On the 5th June the cavalry and mounted infantry had a skirmish not far from the Incenci mountain, in which the adjutant of the 17th Lancers was killed, and two natives were wounded.

Wood's column returns for supplies. A further advance was now made, Wood's Flying Column keeping five miles in front. A fort was formed at the Ityotyosi River, and on arrival of the force at the Upoko the division entrenched itself whilst Wood's column returned with the whole of the empty waggons, 600 in number, to Koppie Allein for the purpose of fetching a month's supplies and storing them at the Upoko. The supplies having been obtained from Landtman's Drift, the column left on the 13th for the Upoko. I had been awaiting an opportunity of getting on to head-quarters, and joined this column. With such an enormous number of waggons and oxen the column moved but slowly, and did not reach Newdigate's Division until the 18th.

A depôt of supplies formed at Fort Marshall. After a short delay the combined forces further advanced, and established a fort a few miles on the other side of the Upoko called Fort Marshall; here a depôt with the month's supplies was formed, it being the intention to make a rapid advance on Ulundi (25 miles distant), with 14 days' provisions, and if possible, effect a junction with General Crealock's Division from the south.

A false alarm at the Ityotyosi River. On the night of the 6th a false alarm occurred at the Ityotyosi camp, resulting in four of the outlying picket being wounded, two severely, two slightly.

When the 2nd Division left Doornberg, a change was made in the line of communication to that via Conference Hill, Balte Spruit, and Utrecht. Doornberg was abandoned as a permanent depôt and field hospital, Conference Hill being substituted and a field hospital of 75 beds being established. Doornberg lapsed into a small wood cutting station with only 1 company of the 2/24th Regiment.

Line of communication changed.

This change of the line of communication I considered would be injurious to the sick and wounded of the 2nd Division and Flying Column, as it subjected them to increased danger and discomfort, the journey to the base hospital at Ladysmith being lengthened by 70 miles of rough road. I represented this, and said that as the route from Ladysmith via Dundee and Landtman's Drift to Koppie Allein was open for the transport of commissariat stores, I failed to see why it could not be used for the sick and wounded as well; upon which it was arranged that on the arrival of the convoy of sick and wounded at Koppie Allein (the point of junction of the two routes), the serious cases and those of them whose state was such as likely to require invaliding were to proceed via Landtman's Drift to Ladysmith, whilst the less serious cases should go by the other route to Utrecht.

Serious cases of sick and wounded proceed by old route to Ladysmith.

Health of the 1st Division.

The health of the 1st Division continued bad, and no hope of permanent improvement was to be expected as long as it occupied the unhealthy locality in which it was quartered. It was a matter of regret that military necessities had hitherto prevented the advance of this division. The men were suffering severely from fevers (continued, remittent, and enteric), diarrhoea and dysentery, the results of marsh miasma, bad water supply, constant exposure to a hot sun by day, and cold by night, fatigue consequent upon heavy picket and convoy duty, and the depression caused by inaction and the prolonged residence in one place, especially in such a district as the coast line near the Lower Tugela. Unprecedented rains had occurred during the period, the dry season, which now added to the other factors of sickness.

Surgeon-Major Girand, Senior Medical Officer of the 2nd Brigade, in his sanitary report states that the admissions into hospital, which were almost exclusively from the diseases before mentioned, averaged amongst the regular troops as high as 203·8, and amongst the irregular troops and Naval Brigade 326·8 per 1,000 mean strength. This medical officer, writing from Fort Chelmsford, goes on to say, "No cases of enteric fever have occurred here; but I have received a memorandum from the Senior Medical Officer of the division to the effect that a large proportion of the fever cases sent down to Fort Pearson turned out to be enteric. As none of the cases treated here were of that nature, it appears that the disease was contracted after the men left this place."

Almost all the cases of enteric fever being first diagnosed as such at Fort Pearson, directions were given to Surgeon-Major Tarrant, Senior Medical Officer of the division, to investigate and report upon the origin and spread of the disease; and he collected reports from the different medical officers, the substance of which will be given hereafter when fevers are brought under review.

The numbers of sick respectively at Forts Chelmsford and Pearson at this period (4th of June) were 11 officers and 97 non-commissioned officers and men, and 14 officers and 309 non-commissioned officers and men, including 40 of the Naval Brigade. So great was the pressure now at Fort Pearson that in order to relieve it at once, all the ambulances being on the road, a number of return empty army service waggons were placed at the disposal of the Senior Medical Officer.

At length the 1st Brigade made a move and advanced in three separate columns at different periods, and the division massed at Fort Chelmsford. Making a short delay here it advanced on the 21st June to Umlalassi Plain, leaving a further detachment at Fort Chelmsford, and establishing a fort called Napoleon, on an abrupt conical hill overlooking the river Umlalassi. This river being crossed without opposition, the division, after passing through two or three large swamps arrived safely at the plain, and encamped on a spot about 10 miles from Fort Napoleon and one and a half from Port Durnford. Several expeditions were now made into the neighbourhood, during one of which Undine, the Zulu King's old military kraal, was destroyed.

The 1st Division makes an onward movement.

A landing place established at Port Durnford.

Port Durnford was now successfully opened as a landing place for stores, and an advanced dépôt for the division with two months' supplies was established. In a short time the port was used with great advantage for the embarkation to Durban of the sick of the force, who thus escaped the dangers and discomforts of the land journey. The sick of Fort Chelmsford were, however, still sent via Fort Pearson, in consequence of the road between Fort Chelmsford and the plain of Umlalassi being so swampy and after heavy rains impassable.

Negotiations for peace.

The 2nd Division and Flying Column continued to advance, and on the 30th June negotiations for peace were entered into, in the course of which Prince Napoleon's sword was returned by Cetywayo. The letter accompanying this was written by a Dutchman, named Vogel, who was at the King's kraal, and who added in pencil on the outside of the letter the information that 20,000 Zulus were collected to oppose the British army.

Conditions not being complied with a forward movement took place.

Lord Chelmsford's conditions not having been complied with, a forward movement was made towards Ulundi on the 3rd July, and the same day the forces arrived at the right bank of the Umvaloosi and laagered.

The next morning, at 6 o'clock, the division, leaving the waggons behind securely laagered, and taking one day's rations and no baggage, crossed the river and formed up in order of battle on the high ground beyond it, on the spot renowned in history as the scene of the great battle between the Zulus and the Boers, when the Zulus chased their flying enemies along a range of hills which is still pointed out to visitors to Ulundi.

The combined forces consisted of the 2nd Division, numbering 1,870 Europeans, 500 natives, and 8 guns, and the Flying Column, numbering 2,192 Europeans, 573 natives, 4 guns, and 2 Gatlings.

Battle of Ulundi.

The troops advanced along the plateau for about three and a half miles. Soon after half-past 7 o'clock the Zulu army was seen leaving its bivouacs, and advancing on the square from all sides. The engagement was shortly after commenced by the cavalry charging to the right and left flank, then retiring before the masses of the enemy into the hollow square, as had been previously arranged. The enemy then advanced with great rapidity, and the engagement became general.

At half-past 9 the enemy wavered, the 17th Lancers, followed by the remainder of the mounted men, attacked them, and a general rout ensued. The prisoners said that Cetywayo made all the arrangements and witnessed the fight from Zakazi's kraal, and that 12 regiments (about 20,000 men) took part in it.

The loss of the enemy could not be estimated with any certainty, but was put down at 1,000 killed.

Our casualties were: Regulars, killed, 1 officer, 9 men; wounded, 10 officers, 71 men. Irregulars, white, killed, 3 men; wounded, 8 officers, 4 men. Blacks, 2 killed, 8 wounded.

The first dressing took place in the left rear of the square in the position occupied by the field hospital during the march. It was here that the principal attack was made. All the wounded of both columns were promptly attended to under fire, and were in readiness after the battle to be carried forward with the troops on the advance towards the King's kraal at Ulundi.

Ulundi burnt.

After the action the force marched to Ulundi, and by noon the King's kraal was in flames, all military kraals of the Zulu army and in the valley of the Umvaloosi being also destroyed during the day.

Forces return to camp.

At 2 p.m. the columns returned to camp on the Umvaloosi, and on the following morning (5th) they marched back to Entonjaneni where they halted. On the 7th the sick and wounded of the Flying Column were transferred to the 2nd Division, and one field hospital only was formed with Surgeon-Major Stafford in charge. For three days the camp was visited by heavy storms which rendered the troops very wet and miserable, were very trying to the sick and wounded, and caused the death of hundreds of oxen.

Lord Chelmsford resigns and Sir G. Wolseley assumes command.

At this period Lord Chelmsford resigned the command in South Africa, and Sir Garnet Wolseley, G.C.B., assumed it.

The columns separate.

On the 10th the camp broke up, Wood's Flying Column proceeding to Kamagwasa and St. Paul's; the 2nd Division with the sick and wounded to the Upoko, where they arrived on the 15th.

On the 18th the convoy of sick and wounded left for the base, and on arrival at Koppie Allein was divided into two, the severely wounded and seriously sick going on via Landtman's Drift and Dundee to Ladysmith, the remainder via Conference Hill and Balte Spruit to Utrecht.

Convoy of sick and wounded leave for base.

The 2nd Division remained at Upoko until the 27th, when it was broken up, the Flying Column being also broken up about the same time.

2nd Division and Flying Column broken up.

Sir Garnet Wolseley having arrived at Durban on the 28th June, after being sworn in as Governor, &c., embarked for Port Durnford. He lay off the port for three days without being able to land, then returned to Durban and proceeded overland to join the 1st Division at Umlalassi Plain.

Sir G. Wolseley joins 1st Division at Umlalasse Plain.

Shortly after the arrival of the 1st Division at Umlalassi Plain a large number of Zulus came in and laid down their arms. Dabulamanzi, the King's brother and ablest general, who commanded, it was said at Isandhlwana and Ginginlovo, at the same time surrendered himself at Fort Pearson.

Zulus lay down their arms at Umlalasse Plain.

There was a marked improvement in the health of the division on its removal from the position it so long occupied on the Lower Tugela; there was much less sickness after its arrival at Umlalassi Plain.

Improvements in health of the 1st Division.

The camp here, however, was not well chosen, being in the vicinity of a vast swamp, but for military reasons I believe this could not have been avoided. In addition to a field hospital for each brigade, a fever hospital was established in an isolated position. No accumulation of sick was allowed to take place, all that could be moved were periodically embarked for Durban, so as to avoid their remaining in such a malarious spot longer than could be avoided. A "transport," the "City of Venice," was usually waiting outside the surf for an opportunity to embark them.

Camp at Umlalassi Plain.

On the 24th July the 1st Division was broken up, and two new columns were formed, viz., Clarke's column, composed of detachments Royal Artillery and Royal Engineers, 57th and 3/60th Regiments, five companies 80th Regiment, two squadrons Mounted Infantry, three troops of Irregulars, and Native Contingents; and Baker Russell's column, composed of one squadron King's Dragoon Guards, N/5th Royal Artillery, detachment Royal Engineers, 94th Regiment, one squadron Mounted Infantry, together with Colonial Volunteers and Native Contingent. This column marched to the Nodweni River, and after establishing entrenched camps named Forts George and Cambridge, near Enhlongana Mission Station, and at the crossing of the White Umvaloosi River by the Utrecht-Ulundi road respectively, it proceeded to the neighbourhood of Kamblula where it attacked and subjugated some refractory chiefs. It then advanced to Utrecht and Wesselstroom, and being strengthened by the 21st Regiment and other details, it became the Transvaal column, which ultimately operated against Secoceoni.

1st Division broken up, two new columns formed.

Clarke's column marched with Sir Garnet Wolseley to Ulundi, and was encamped there for a time, strong posts being left at the intermediate stations of St. Paul's and Kamagwasa.

After the battle of Ulundi the Zulu army dispersed to their homes. A cavalry reconnoitering party was sent to the King's new kraal at Amanzekanze, about 12 miles from Ulundi, and recovered the two guns of Harness' battery lost at Isandhlwana. The next day (the 12th July) the King's magazine, 10 miles off, was visited, and a large quantity of gunpowder found there, destroyed.

Zulu army disperses. Recovery of two guns lost at Isandhlwana.

On the 14th August Captain Barrow with his mounted men reached the kraal in which Cetywayo had taken refuge, but found that he had left it the night before. The pursuit was continued from day to day, and Lord Gifford, V.C., more than once nearly effected his capture. On the 24th six companies of the 3/60th Rifles under Colonel Clarke went out with 10 days' rations to the Ngome Forest beyond the Black Umvaloosi, where it was known that Cetywayo then was in comparative safety, the bush being so dense, and the locality very unhealthy for Europeans.

Pursuit of Cetywayo.

The King's Dragoon Guards under Major Marter, with Lord Gifford and Barrow's mounted men, left camp about the same time.

On the 28th the kraal in which Cetywayo was known to be, was surrounded by the dragoons, when he came out and surrendered himself to Major Marter. He was brought to Ulundi, and on the 1st September was hurriedly conveyed to Port Durnford and shipped with his wives and servants for Cape Town, where he remains a state prisoner in the castle.

His capture.

Clarke's column
march for Natal.

Sir Garnet Wolseley having convened a meeting of chiefs at Ulundi, and made arrangements as to the future government of Zululand, Clarke's column left Ulundi on the 2nd September for Kamagwasa, marched thence through the Inkanyha district (which was said to be disaffected and unsubdued, but where no opposition was met with) to the Middle Drift on the Tugela River, where it crossed into Natal and proceeded via Greytown to Pietermaritzburg. On its arrival here on the 4th October it was broken up.

Zululand
evacuated.

Sir Garnet Wolseley and staff escorted by a squadron of King's Dragoon Guards started for Pretoria via Utrecht the morning after Clarke left.

The posts on both routes were abandoned as the troops proceeded, so that by the end of September the whole of Zululand was evacuated. A few days later Fort Pearson was also abandoned, when the campaign may be said to have ended.

Relative health-
iness of North
and South Zulu-
land.

It was remarked by the various medical officers of Lord Chelmsford's force that the regiments and corps both of the 2nd Division and Flying Column which had enjoyed such excellent health during the period of their sojourn in the high lands of the interior of Zululand suffered in health, and in many instances contracted fever, directly they descended towards the coast and got near St. Paul's Mission Station—which, although situated on high ground, overlooks the valley of the Umvaloosi, a valley 10 miles in length, and reputed to be especially unhealthy and fatal to horses and oxen benighted in it, so that transport riders make it an invariable rule to hurry their ox waggons through it before nightfall—on the contrary, the same troops when returning to the high lands experienced a marked change for the better in their health.

The same thing was observed by the medical officers of Clarke's and Baker Russell's columns, notably in the 57th and 3/60th Regiments, which had belonged to the 1st Division and suffered so severely on the coast. Directly they began to ascend the broken ridges and hills forming the second terrace, and ultimately reached the rolling upland on which Ulundi is situated, they improved in health.

Relative health
of the 1st and
2nd Divisions.

There was a marked difference in the state of health of the 1st and 2nd Divisions, including the Flying Column, during the whole period of active operations. Whilst the latter enjoyed a high standard of health, the former suffered much from fever, diarrhoea, and dysentery. The cause of this was twofold; in the first place, the climatic conditions in which the two divisions were placed were wholly different, the 1st Division was operating on the coast line (which is hot, low, and interrupted by swamps) during a period when it is pregnant with malaria and when fever prevails, viz., the months of March, April, May, and this year June, in consequence of the unprecedented late rains. During these months traders never think of remaining in the country, and even natives suffer from fever. The 2nd Division, on the other hand, operated in the northern part of Zululand, on the rolling uplands which are bracing and remarkably healthy, being from 1,500 to 2,000 feet above the sea level. Secondly, the 1st Division was kept stationary for a long period in more or less insanitary camps, due to the presence of native troops and large numbers of oxen, and performing monotonous duty; whilst the 2nd Division moved about, made reconnaissances, changed camps frequently, and were employed in making new forts.

General return
of diseases of
1st Division.

The effects of a protracted occupation of an insanitary and malarious locality upon the troops comprising the 1st Division are seen by looking at the general return of diseases of the division.

There were 1,328 admissions into hospital under subdivision A., general diseases, of which enteric fever shows 295 cases with 69 deaths, simple continued fever 538 with 9 deaths, and remittent fever 262 with 3 deaths.

The 58 cases of ague were, with few exceptions, men of the 2/3rd and 88th Regiments, just returned from the Mauritius.

The prevalence of enteric fever was attributed by Surgeon-Major Tarrant, Senior Medical Officer of the division, to importation of the disease into Fort Pearson from Thring's Post and Saccharine. But it would appear that these were not the only sources from which it came, for this officer in his report says, "A large proportion of the cases admitted under remittent fever at Fort " Chelmsford when transferred to Fort Pearson had their disease changed to

“ enteric, many such cases proving fatal ; the same remark applies to admissions under the head of simple continued fever.”

As regards affections of the bowels, there were 221 dysentery and 341 diarrhoea, the greater proportion of which came from Fort Chelmsford. Here again Surgeon-Major Tarrant mentions the relation which he considers exists between these diseases and enteric fever, and regrets that post-mortem examinations were not made in every case.

He concludes by unwillingly expressing his dissent from the diagnosis of his colleagues, and fears that all the cases must have been enteric.

Surgeon-Major Hodgson corroborates this. He says, “ Numbers of men came from Fort Chelmsford with remittent and simple continued fever, of which a large portion proved to be enteric. In a general way, though a large proportion of the fevers were returned as simple continued, my impression is that nearly all the cases were enteric of a milder or more severe type. From such inquiries as I was able to institute I conclude that enteric fever was originally brought from Durban, and was carried by the troops to the various stations where it broke out, and that in all cases it was aggravated by the gathering together of a large number of men and cattle, and the insanitary state which always accompanies such conditions.”

On the other hand, Surgeon-Major Giraud, Senior Medical Officer of the 2nd Brigade at Fort Chelmsford, speaking first of Ginginlovo, says as follows : “ I found on arrival that there was much sickness caused by fever, dysentery, and diarrhoea. We arrived at the spot near the Inyezane River, afterwards named Fort Chelmsford, on the 26th April, and though there was soon a decrease in the number of cases of dysentery and diarrhoea, fever continued to prevail to a very great extent. The disease with which we had to deal at this period of our occupation of Fort Chelmsford was in my opinion, and in that of all the other medical officers, both military and naval, continued fever ; and the results, judging from the cases remaining under our care, proved that we were correct. It is true that by far the greater number were sent away, those retained being slight cases and men too ill to bear moving. About the middle of May a change in the type of fever began to be observed, and at the same time cases of jaundice became numerous. The disease with which we now had to do was undoubtedly remittent fever, the severe remittent of hot climates, or as it has been called typho-malarial, and of all degrees of severity. Some very slight passing off in a few days, others were of extreme severity with high fever and delirium, which left the patient extremely prostrate. In the very great majority of cases the patient was more or less jaundiced ; in the early stage of all there was hepatic congestion and gastric irritability. In some cases there was diarrhoea, in others constipation, and this seemed to depend very much upon the amount of jaundice which accompanied the fever. In those cases where diarrhoea was a symptom the stools were not those of enteric fever, but though fluid or semi-fluid they were bilious fœcal stools. The urine in most of the cases was very high coloured, sometimes as dark as strong tea or coffee. The temperature ranged very high, 104° and 105°, but did not follow the course of enteric fever, and in all except the most severe cases there were distinct remissions. Our treatment was milk diet and quinine in 5 grain doses, combined with opium if there was diarrhoea and no delirium. During the period there were but two deaths, undoubtedly the one from simple continued fever, the other from remittent. Staff-Surgeon Shields, R.N., Surgeon-Major Boulton, and myself all agreed that until a short time before we left, when cases were brought from below, we had no enteric fever under treatment at Fort Chelmsford.”

Surgeon-Major Edge in medical charge of 91st Regiment, says “ during the month of April the troops encamped at Ginginlovo suffered much from fever (simple continued) ; most of the cases were found to have a very high temperature, which varied very little for four or five days, the fever then passed away, leaving the patient weak and debilitated. Shortly after the troops changed to Fort Chelmsford, the fever commenced to assume the type of bilious remittent fever of the West Indies ; the cases varied much, the temperature in all cases was very high and the remissions difficult of detection in the early stages of the fever. Some cases commenced with

“ jaundice and constipation, others with bilious vomiting and diarrhoea again, other cases came to hospital delirious and sank rapidly from obstinate vomiting and diarrhoea; hæmorrhage was common in these cases. Of those treated at Forts Chelmsford and Crealock (which were not the mildest cases, being generally those unfit to move when the convoy started), nearly all yielded to treatment, calomel and quinine. I saw no enteric fever at either Forts Chelmsford or Crealock, and the cases I saw afterwards on the march from Port Durnford to Ulundi and back to Natal were not easy of recognition, the rose-coloured spots were absent in all cases I saw, the temperature chart gave no assistance, and in the advanced stages of severe cases of remittent fever, the patients got into a typhoid state and died from ulceration and perforation of the bowels. Post-mortem examination revealed the great difference between the diseases as regard the structure effected; in remittent fever the ulceration was not in Peyer’s patches, or certainly not confined to them, nor were Peyer’s patches or the solitary glands traceable in the great inflammation and thickening of the lower part of the ileum. In the enteric cases the post mortem revealed the inflammation and ulceration confined to the Peyer’s patches and solitary glands.”

Surgeon-Major Boulton, who was in medical charge of the 3/60th corroborates the statement of the two other medical officers of the 2nd Brigade; he says that “ at Ginginlovo, a few cases of febricula and simple continued fever occurred in the battalion, two cases of the latter proving fatal from brain effusion, but no post-mortem examination being made. Soon after arrival at Port Chelmsford a large number of admissions to hospital commenced from fever of quite a different type to that which previously occurred, and which I at once recognised as malarial remittent, similar to that seen by me in the West Indies and Demerara, and characterised by distinct exacerbations and remissions and attended by much functional disturbance of liver and kidneys and splenic congestion, but in none of the cases were the characteristic symptoms of true enteric fever present. A few cases proved fatal but no post-mortem took place. At the latter end of May, it having been intimated to Surgeon-Major Girard that some of the cases sent down by us to Tugela had proved to be cases of enteric fever, I became, if possible, more vigilant of the symptoms in each individual case of remittent and continued fever that came under my observation, but in none was I ever able to discern symptoms of specific enteric fever. I am aware that no less an authority than the late Dr. Murchison pointed out that enteric fever, though a continued fever, might and often did assume a remittent type as regards exacerbations. I am also aware that from the great similarity of lesions found after death many have pronounced malarial remittent fever and enteric fever as identical, but I cannot agree with the latter, and consider that the two diseases are different, and are produced by very different causes, the symptoms differing widely as regards functional derangements, excreta, and course and duration of fever, the rose-coloured spots never presenting themselves in remittent. The pathological differences are not so marked. In the West Indies and Demerara I have seen fatal cases of remittent fever present all the post-mortem appearances of enteric, not alone in small intestines, but extending to the colon, with, in addition to glandular ulcerations, extensive patches of ecchymosis of intestines, and I have known some of the cases to have ended fatally from intestinal hæmorrhage. I feel perfectly convinced that the cases of fever I treated amongst the 3/60th at Fort Chelmsford were in a few instances simple continued fever, and in far the greater number, remittent fever, the latter solely produced by malarial poisoning and climatic influences, and in no instance did I ever discover a case of specific enteric fever.”

Surgeon Wilson, speaking of Ekowe, says “ the entire cases of enteric fever occurred in the 3rd Field Hospital solely amongst the 99th Regiment. It was remarkable that no case occurred amongst the Artillery or Mounted Infantry. These were located on the opposite side of the fort to the 99th, who, separated only by the rampart and ditch had for their nightly neighbours several hundred oxen closely packed together. Amongst so large a number of cattle many were constantly dying.”

Whether the type of fever which was prevalent at the Lower Tugela and on the coast line was enteric, remittent, or typho-malarial, it is quite obvious that two such important potential agents were at the same time in operation, as malaria and the insanitary condition of camps inseparable from a large number of native troops and camp followers, a cattle laager, and probably impure water.

Although Surgeon-Major Tarrant and the medical officers under him at Fort Pearson refer to the fever prevalent at Fort Chelmsford as typical enteric, yet, in my opinion, and in that of several experienced medical officers, the symptoms could not be dogmatically classified as true enteric. In fact, I incline to the belief that there were two distinct fevers prevalent at the same time, viz., true remittent or bilious remittent or coast fever, and typho-malarial or camp fever. The latter, under the before mentioned insanitary conditions, always more or less present whilst troops are in the field, appears invariably to be developed in South Africa. This was evidenced in an outbreak of the same type of fever in the columns of British troops when marching to take possession of the Transvaal in 1877, and again during the late Galeaka-Gaika campaign in the Cape Colony. The fever is enteric, complicated in its symptoms and progress by exposure of the subjects to malarious exhalations, or to the poisoning of the system by the use of malarious water. Again, the fever may have been induced solely, in my opinion, by the drinking water, the water in South Africa commonly containing both animal and vegetable matter, the animal matter being consequent upon the filthy habits of the natives (who, when practicable, perform the functions of nature on the banks of rivers and streams), or the carcasses of oxen. It is well known that animals, when affected by lung sickness, so common in the country, make for the nearest water whereto to quench their thirst and to die.

The fever I saw at Fort Chelmsford was certainly more allied to remittent than enteric. At Umlalassi Plain, St. Paul's, and Ulundi, it was undoubtedly bilious remittent, commencing generally with bilious vomiting and soon developing jaundice. As regards this latter symptom, it was a remarkable fact that a large number of the 1st Division presented a jaundiced appearance although not complaining of illness, whilst nothing of the kind was observed in the 2nd Division.

An important fact bearing upon the etiology and type of the fever was disclosed by the movements of the respective columns. The Flying Column, the health of which was exceptionally good so long as it remained in North Zululand, showed evidence of malarious influence when it marched southwards and arrived at St. Paul's; on the other hand the 57th and 3/60th Regiments which had suffered so severely from fever at Fort Chelmsford, improved in health as they proceeded northwards to Ulundi. In regard to the 60th Regiment, however, it was found that, after the fatigue and exposure to which they were subjected in the pursuit of Cetewayo in the Ngome Forest, fever and sickness in a great measure returned, showing that malaria was still lurking in their systems.

Considering that remittent is only intermittent fever in an intensified form, the absence of the latter amongst the troops on the coast line, excepting the 2/3rd and 88th Regiments lately returned from the Mauritius, is remarkable.

The diarrhoea and dysentery which also prevailed in the 1st Division was due in great part to malarious causes, at any rate, these diseases assumed a malarious character.

The water at many of the camps and halting places, especially on the coast line, was not found good and wholesome. After rains it was generally turbid from the suspension of clay, mica, or firm sand, and during the dry season the rivers and spruits became very low and the streams sluggish, the water on analysis containing organic vegetable matter, and animal matter as well if the stream from which the water was taken was near a much frequented road, for numbers of oxen which died from exhaustion and starvation during the trek were left unburied on the ground. On the coast the water was always more or less impregnated with chloride of sodium. Water.

The regulations were not carried out by attaching men of the Army Service Corps to the Medical Transport, civilian conductors, Hottentot drivers, and native leaders being employed. The result of which was that the transport Medical transport.

arrangements were not so satisfactory as could have been wished. In future wars I would strongly recommend that a purely medical transport be organized with its own harness makers, wheelwrights, &c.

Sickness and Mortality.

The war in Zululand consisted of two phases, or distinct and successive series of operations.

The first of these may be said to have begun on the departure of General Wood's Flying Column to Utrecht in August 1878, although active operations did not actually commence until the crossing of the Tugela River by the British forces on the 6th January 1879, from which date the returns of sick for troops on active service were prepared. This series of operations terminated with the disaster at Isandhlwana on the 22nd January 1879, and the consequent withdrawal of the troops from all the advanced posts, with the exception of Ekowe.

The second phase of the war began with the advance of the relieving column to Ekowe on the 29th March, part of the reinforcements having then arrived from England, and terminated with the breaking up of Clarke's Column at Pietermaritzburg on the 3rd October.

The troops taking part in the first set of operations were: N/5 and 11/7 Batteries Royal Artillery, 2nd Company Royal Engineers, 2/3rd, 2/4th, 1/13th, 1/24th, 2/24th, 80th, 90th, and 99th Regiments, 125 Natal Mounted Police, 400 Mounted Volunteers, 5,000 Native Contingent, a few of the Army Service, Ordnance, and Army Hospital Corps. The officers at this period, besides those of regiments, corps, staff, and departments, consisted of only a small number attached to irregular corps.

The troops employed in the second phase were those just enumerated, together with the following reinforcements: M/6, N/6, and O/6 Batteries Royal Artillery, 30th Company and C Troop Royal Engineers, King's Dragoon Guards, 17th Lancers, 2/21st, 57th, 58th, 3/60th, 88th, 91st, and 94th Regiments, and a large increase of the Army Service Corps, Ordnance, and Army Hospital Corps. The officers during the same period were greatly increased in number by a large draft of special service officers.

During the first period the deaths amongst the regular troops were—

Killed in action	-	-	-	-	30 officers, 762 men.
Died of wounds received in action	-	-	-	1	8
Died of disease or accident	-	-	-	5	73
Total	-	-	-	36	843

During the 2nd period—

Killed in action	-	-	-	-	3 officers, 15 men.
Died of wounds received in action	-	-	-	4	15
Died of disease or accident	-	-	-	10	241
Total	-	-	-	17	271

The following tables show the sickness and mortality amongst the troops during the period from 4th January to 3rd October 1879 :—

TABLE No. 1.

Regular Troops.

Officers.												
Corps.	Strength.	Fevers.		Dysentery and Diarrhoea.		Wounds in Action.		Other Causes.		Totals.		Invalided to Eng-land.
		Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	
1st K. D. Guards	22	—	—	2	—	—	—	2	—	4	—	1
17th Lancers	25	—	—	—	—	—	—	1	—	3	—	2
R. A.	32	9	—	2	—	—	1	8	—	22	1	2
R. E.	16	7	1	1	—	—	—	4	1	12	2	2
23rd Regt.	23	9	2	8	1	1	—	6	—	24	3	2
24th	28	7	—	1	—	—	—	9	—	17	—	3
1/13th	27	5	—	—	—	3	1	11	—	19	1	6
2/21st	29	1	—	2	—	1	—	1	—	5	—	1
1/24th	29	6	—	3	—	1	—	5	—	15	—	1
2/24th	24	8	1	—	—	—	—	10	—	20	1	3
57th	28	7	—	5	—	1	—	9	—	22	—	3
58th	19	2	—	2	—	—	—	9	—	15	—	—
3/60th	26	11	1	19	1	1	1	17	—	48	3	12
80th	27	3	—	—	—	—	—	5	—	8	—	1
88th	15	9	1	1	—	—	—	5	—	15	1	3
90th	23	4	1	1	—	3	1	6	—	14	2	3
91st	21	11	—	3	—	—	—	10	—	24	—	7
94th	24	1	—	—	—	—	—	4	—	5	—	2
99th	25	7	2	6	—	1	1	20	—	34	3	9
General Staff	44	13	—	8	—	3	—	6	1	30	1	8
Commt. Dept.	59	19	—	4	—	—	—	22	—	45	—	9
Ordnance Dept.	19	1	1	—	—	—	—	2	—	3	1	—
A. Med. Dept.	69	7	—	6	—	—	—	13	—	26	—	7*
A. H. Corps	8	—	—	2	—	—	—	3	—	5	—	—
A. Pay Dept.	13	1	—	1	—	—	—	2	—	4	—	2
Veterinary Dept.	3	2	—	1	—	—	—	2	—	5	—	—
Chaplain's Dept.	4	2	—	1	—	—	—	2	—	5	—	—
Totals	682	152	10	81	2	22	5	194	2	449	19†	96

* The following casualties also occurred amongst civil surgeons:—1 killed in action, 2 died of disease, and 1 invalided.

† One death occurred out of hospital in addition to those here given, viz., a case of accidental drowning in the Free State.

Non-commissioned Officers and Men.

Strength.	Admissions.							Remarks.
	Fevers.	Rheumatism.	Heart Affections.	Dysentery and Diarrhoea.	Wounds in Action.	Other Causes.	Total.	
12,631	2,789	574	189	1,522	162	4,274	9,510	The regiments having been so broken up to garrison the different posts, it has been found impossible to give the admissions by corps.

Non-commissioned Officers and Men.

Corps.	Strength.	Deaths.												Ratio per 1,000 of Strength.
		Fevers.		Heart Affections.		Dysentery and Diarrhoea.		Wounds in Action.		Other Causes.		Totals.		
		In Hospital.	Out of Hospital.	In Hospital.	Out of Hospital.	In Hospital.	Out of Hospital.	In Hospital.	Out of Hospital.	In Hospital.	Out of Hospital.	In Hospital.	Out of Hospital.	
1st K. D. Gs. -	354	1	—	—	—	—	—	—	—	3	1	4	5	14.1
17th Lancers -	402	2	—	—	—	—	—	—	—	—	—	—	2	7.4
R. A. -	597	6	—	—	—	5	—	1	—	2	1	3	15	25.1
R. E. -	348	11	—	—	—	2	—	—	—	15	—	15	43.1	
2/3rd Regt. -	807	11	—	—	—	4	—	2	—	6	1	23	28.7	
2/4th " -	724	8	—	1	—	4	—	—	—	3	1	16	22.0	
1/13th " -	704	16	—	—	—	1	—	8	—	4	2	31	44.0	
2/21st " -	598	2	—	—	—	1	—	—	—	1	—	1	7	11.7
1/24th " -	453	4	—	—	—	3	—	—	—	2	1	7	15.5	
2/24th " -	857	12	—	—	—	1	—	1	—	2	4	18	20.8	
57th " -	645	8	1	—	—	4	1	1	—	1	—	14	21.6	
58th " -	607	5	—	—	—	—	—	1	—	3	1	9	14.8	
3/60th " -	590	27	—	—	—	9	—	1	—	5	2	42	70.5	
80th " -	842	—	—	—	1	2	—	—	—	6	1	8	9.5	
88th " -	452	2	—	—	—	1	—	—	—	1	1	4	8.8	
90th " -	846	6	—	—	—	—	—	5	—	—	—	12	14.1	
91st " -	575	12	—	1	—	2	—	—	—	1	—	17	29.6	
94th " -	609	4	—	—	—	5	—	1	—	1	1	11	18.0	
99th " -	764	24	—	—	—	3	1	—	—	5	3	32	41.7	
A. S. Corps -	877	9	—	—	—	3	—	—	—	4	1	16	18.3	
A. H. Corps -		5	—	—	—	4	—	—	—	2	—	11	12.5	
Other Corps -		—	—	—	—	—	—	—	—	—	—	—	—	—
Staff and Depts. -		—	—	—	—	—	—	—	—	—	—	—	—	—
Totals -	12,651	175	1	2	1	55	2	23	—	54	24	300	237	26.68

Non-commissioned Officers and Men.

Corps.	Strength.	Invalided.							Ratio per 1,000 of Strength.	
		Fevers.	Rheumatism.	Heart Affec- tions.	Dysentery and Diarrhoea.	Wounds in Ac- tion.	Other Causes.	Total.		
1st K. D. Guards	-	354	2	2	-	2	-	3	9	25.4
17th Lancers	-	402	-	1	-	1	-	7	9	22.3
R. A.	-	597	21	5	2	6	-	24	58	97.1
R. E.	-	348	23	4	6	3	-	23	59	169.5
2/3rd Regt.	-	807	28	14	3	7	1	49	102	126.4
2/4th "	-	724	-	2	7	-	-	16	25	34.5
1/13th "	-	704	1	2	3	1	3	12	22	31.2
2/21st "	-	598	4	13	14	2	1	21	55	91.9
1/24th "	-	453	4	4	3	-	1	21	33	72.8
2/24th "	-	857	3	7	6	1	3	28	48	56.0
57th "	-	645	54	3	3	8	1	56	125	193.8
58th "	-	607	5	4	1	4	-	20	34	56.0
3/60th "	-	590	58	6	4	9	3	38	118	200.0
80th "	-	842	1	5	2	5	1	16	30	35.6
88th "	-	452	19	2	7	5	1	37	71	157.1
90th "	-	846	1	4	6	7	8	18	44	52.0
91st "	-	575	31	12	6	5	1	35	90	156.5
94th "	-	609	3	1	-	6	2	5	17	27.9
99th "	-	764	10	8	3	7	2	41	71	92.9
A. S. Corps	}	877	13	5	2	3	-	17	40	83.2
A. H. Corps			17	-	-	3	-	9	29	
Other Corps			1	-	-	-	-	1	2	
Staff and Depts.			-	-	1	-	-	-	2	
Totals	-	12,651	299	104	79	85	28	498	1,033	86.4

Ages of Non-commissioned Officers and Men Invalided and Died.

Corps.	Under 19.		Over 19 and under 20.		Over 20 and under 21.		Over 21 and under 22.		Over 22 and under 25.		Over 25 and under 30.		Over 30 and under 35.		Over 35.		Totals.	
	Invalided.	Died.	Invalided.	Died.	Invalided.	Died.	Invalided.	Died.	Invalided.	Died.	Invalided.	Died.	Invalided.	Died.	Invalided.	Died.	Invalided.	Died.
1st K. D. Gs.	—	—	—	—	—	—	—	—	3	4	2	1	2	—	2	—	9	5
17th Lancers	—	—	—	—	4	—	1	—	3	—	—	—	—	—	—	—	4	—
R. A.	—	—	—	—	2	1	1	4	23	8	15	4	5	1	9	—	58	15
R. E.	—	—	2	1	11	1	8	3	22	7	14	2	1	1	1	—	59	15
2/3rd Regt.	—	1	—	—	6	—	1	15	4	38	9	28	4	—	11	1	102	24
2/4th	—	—	1	3	1	2	4	1	11	5	5	6	—	—	—	—	25	17
1/13th	—	1	—	3	2	4	1	4	2	7	6	6	3	4	3	—	22	31
2/21st	—	—	1	—	13	—	—	—	5	—	2	—	1	18	1	—	55	7
1/24th	—	1	—	1	2	1	2	—	9	1	9	3	1	10	1	—	33	8
2/24th	—	—	2	2	6	—	—	—	14	8	5	4	6	1	7	—	48	22
57th	—	2	7	1	10	2	11	1	40	4	34	6	—	13	2	—	125	16
58th	—	2	1	1	4	—	9	1	4	3	8	2	3	2	8	—	34	10
3/60th	—	5	7	4	14	1	14	11	33	17	26	8	2	11	1	—	118	44
80th	—	—	—	—	2	—	2	1	4	4	11	2	7	1	4	—	30	10
88th	—	2	1	1	11	—	11	—	21	2	18	1	5	5	1	—	71	5
90th	—	1	1	—	9	—	4	8	4	11	2	7	2	4	—	—	44	12
91st	—	5	1	7	15	3	18	4	21	5	15	1	4	5	2	—	90	17
94th	—	1	—	1	1	—	2	—	6	7	5	2	3	1	—	—	17	12
99th	—	1	—	2	6	4	17	12	16	14	14	3	10	7	1	—	71	36
A. S. Corps	—	—	—	1	2	—	2	—	5	5	19	6	3	6	—	—	40	17
A. H. Corps	—	—	5	—	2	—	1	—	5	7	7	5	4	1	3	—	29	11
Other Corps	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	2	—
Staff and Depts.	—	—	—	—	—	—	—	—	—	—	—	—	2	—	—	—	—	—
Totals	23	5	35	21	123	25	143	53	298	122	250	75	94	18	122	18	1,068	337

TABLE No. 2.
Irregulars—White.

Officers.													
Fevers.		Rheumatic Affections.		Heart Affections.		Dysentery and Diarrhoea.		Wounds in Battle.		Other Causes.		Totals.	
Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.
32	2	5	—	—	—	28	4	8	3	35	—	108	9
													Killed in Action.
													34

Non-commissioned Officers and Men.

Strength.	Fevers.		Rheumatism.		Heart Affections.		Dysentery and Diarrhoea.		Wounds in Battle.		Other Causes.		Totals.		Killed in Action
	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	
1,942	477	24	65	—	6	—	277	10	55	7	553	15	1,433	56	153

TABLE No. 3.

Irregulars—Black.

Non-commissioned Officers and Men.															
Strength.	Fevers.		Rheu- matism.		Heart Affections.		Dysentery and Diarrhoea.		Wounds in Action.		Other Causes.		Totals.		Killed in Action.
	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	Admitted.	Died.	
5,436	88	8	62	—	3	1	87	5	39	16	526	11	806	41	<i>Circa. 320</i>

NOTE.—This last table shows a very much smaller proportion of admissions and deaths to strength than the other tables. This is accounted for by the Black Irregulars, for the most part when sick, returning to their homes to be treated by their witch doctors.

Pietermaritzburg, Natal,
21st January 1880.

(Signed) J. A. WOOLFRYES,
Surgeon-General.

APPENDIX No. V.

**DIARY (MEDICAL) OF THE MARCH OF THE FIELD FORCE OF
LIEUTENANT-GENERAL SIR F. ROBERTS, V.C., G.C.B., FROM
CABUL TO KANDAHAR.**

By Acting Deputy Surgeon-General JAMES ARTHUR HANBURY, M.B.,
A.M.D.

On 15th September 1880 I received information from Sir Donald Stewart that, under instructions from Army Head-Quarters, I was appointed Principal Medical Officer, of Sir F. Roberts' force, which had already marched out of Cabul en route to Kandahar.

I immediately joined the force at Beni-Hissar, a village about 5 miles from Sherpur, and in the neighbourhood of which the troops were encamped.

The infantry division was under command of Major-General J. Ross, C.B., Officiating Deputy Surgeon-General J. Ekin was appointed Principal Medical Officer of this division.

The Surgeon-General, Simla, very properly nominated two Deputy Surgeon-Generals for service with this force.

The strength of the Column is in round numbers 10,000 fighting men and 8,000 followers. All troops and followers composing it were carefully weeded out previous to marching from Cabul. It was, therefore, a picked force and probably the finest that has ever taken the field in this or any other country.

Previous experience, during the different phases of this war, had convinced me that to administer effectively for a force of this size the safest course to pursue was to conform to and follow closely the lines laid down for organisation and discipline in the military branches. Decentralisation and distribution of duties and responsibilities were therefore the principles on which I proposed to carry on the administrative work.

Brigade surgeons were appointed for each brigade. They acted in every sense as Principal Medical Officers of their respective brigades; through them were forwarded all reports and returns, and by them all sanitary arrangements of the brigade were made.

The field hospital consisted of three sections, one attached to each brigade. The sick of the cavalry brigade were treated in one or other of the sections. Section A. (1st Brigade) under medical charge of Surgeon-Major E. Hopkins, Surgeon-Major W. F. Bennett, Subordinates C. J. Atkins, H. Day, and R. Marriott, attached for duty.

Section B. (2nd Brigade) under medical charge of Surgeon-Major G. W. McNalty, Surgeon M. Cotton, Subordinates S. O. Forrest and J. Van Weim, attached for duty.

Section F. (3rd Brigade) under medical charge of Surgeon-Major E. C. Markey, Surgeon J. Brodie, Subordinates D. Jones, P. H. W. Mungavin, R. J. Lewis, attached for duty. To each of these sections a sub-section was attached in charge of a hospital assistant, and supervised by the medical officer in charge, for the treatment of the sick followers of European corps and of followers other than regimental.

The regimental system obtained throughout amongst the Native troops and their followers were treated regimentally.

The position of the field hospitals on the line of march was in front of all baggage, field park, and 2nd reserve ammunition.

In addition to the medical officers already mentioned as attached to the field hospitals, there was one for each battery and regiment, but there was not one on the reserve list. Had even one medical officer been rendered unfit for duty, serious inconvenience must have resulted.

The sick bearer carriage supplied at Cabul was as follows: Europeans, 5 per cent.; Native troops, 3 per cent.; followers, $1\frac{1}{2}$ per cent. Mule or pony carriage, Europeans, 2 per cent.; Native troops, 4 per cent.; followers, $1\frac{1}{2}$ per cent.

The sick transport of all kinds was attached to regiments, and its maintenance and discipline provided for regimentally.

The following arrangements were observed in the line of march:—

Two doolies and two dandies accompanied each battery of artillery; two doolies four dandies each European regiment; two doolies six dandies each Native regiment.

The rest of the sick transport and sick, whether European or Native, marched with the sectional hospitals of their respective brigades. The sick transport and sick of Native regiments rejoined their regiments at the end of each march.

The Brigade Surgeon of the brigade on rear guard furnished the sick transport to pick up all stragglers in the rear. When two or more brigades marched together the field hospitals moved in rear of all, still maintaining their proper position immediately in front of the second reserve ammunition. All the arrangements now detailed were published in Field Force Orders.

On this morning the force marched from Cabul and encamped on a plain in the neighbourhood of Beni-Hissar, about 5 miles south of Sherpur on the road to the Logar Valley. Here all final arrangements for the long march before us were made.

Cabul, 8th
August

Zaidabad,
16 miles, August
9th.

Marched at 4.30 a.m. through the Logar Valley and Charaseah; encamped on a dry sandy plain on the left bank of the Logar River. A halt of 50 minutes was made on this march, good water was procurable in abundance all along. The men, from their long inaction at Cabul, for sometime were by no means in a fit condition for hard marching, and consequently suffered a good deal from thirst and heat.

The 2nd Brigade (Baker's) marched from Indigni, a village in the Chardeh Valley, close to Cabul, crossed the Logar River and encamped on its right bank about 2 miles in advance of the 1st and 3rd.

Zergunshah, 13
miles, August
10th.

"Rouse" at 2.45 a.m., marched at 4 a.m. The 2nd Brigade, with the cavalry brigade, crossed over a small kotal to the west of the road followed by the 1st and 3rd Brigades, and encamped on a plain near Mogul-Khyel.

The 1st and 3rd moved across a bleak, dry, pebbly plain, with occasional patches of vegetation and abundance of excellent water.

The leading brigade reached camp at 10 a.m. Hereabouts the soil is richly cultivated, and there is no lack of melons, grapes, onions, pumpkins, and Indian corn.

The exposure to the sun on arrival in camp waiting for tents and baggage is very trying. Many men fell out from blistered feet, but beyond these there is absolutely no sickness.

Padkhow-Rogan,
16½ miles,
August 11th.

"Rouse" at 2.45 a.m., marched at 4, 3rd Brigade leading, 12 miles over a bleak, sandy, plain, through a narrow opening in the hills into the plain where Brigadier-General Palliser of Hill's Division encountered the Zermutties and fought the action called the Battle of Padkhow-Shanand, on the 1st July last.

The last 3 miles was over a narrow road overhanging the Logar River, through some mud villages, finally emerging on a dry plain where the encampment was formed on low rolling hills.

2nd Brigade and cavalry marched from Mogul Khel by a road skirting the hill through Paid Khel and joined us here.

Europeans and Natives have fallen out in some numbers suffering from bilious vomiting and blistered feet.

Amir Killa, 10½
miles, 12th
August.

"Rouse" at 3.45., moved off at 5, up the Logar Valley through a succession of villages; country richly cultivated along the banks of the Logar River. The road on this march bends to the west towards Tangi-Wardak.

The 2nd Brigade crossed the Zumbarak Kotal into the Chiniz Valley in the Wardak Country.

The cavalry brigade reached the same valley by the Tangi Wardak Pass. Both encamped near Saidabad.

The 1st and 3rd Brigades encamped on the north or Cabul side of the Zumbarak Kotal. The men and animals of the 2nd Brigade were greatly dis-

tressed by this march. Having to surmount a pass of something like 1,500 or 1,800 feet high at the end of a 10 miles march on a scorching hot day was a task of no ordinary kind.

The brigade further bivouacked that night on scanty rations, as the tents and baggage could not be got over till next morning.

"Rouse" at 2.45 a.m. 1st Brigade marched across the Zambarak Kotal, the 3rd Brigade over the Tangi-Wardak. Both moved up the Chiniz Valley and encamped about 2 miles behind the 2nd Brigade. This is by far the most cheerful position we have yet seen; abundance of good water, green trees, grapes, melons, onions, pumpkins, and Indian corn. The 2nd Brigade is much knocked up by its march across the Zambarak Kotal the previous day. Dyspepsia, bilious vomiting, diarrhoea, and constipation prevail, due to fatigue, exposure to the sun and the irregularity of their meals. There is now a bright moon for our early marching.

Takia, 12 miles,
13th August.

"Rouse" at 2.45 a.m., marched at 4 up the Wardak Valley over a stony plain with occasional patches of vegetation. Water at frequent intervals in wells and "karaises" (under-ground aqueduct) leading from the Chiniz River.

Shasgow, 17 miles,
14th August.

Encamped on an extensive plain at the foot of the Shir-u-dana Pass leading into the Guzni Valley. Here for the first time the whole force encamped close together. Hitherto the cavalry encamped some 4 or 5 miles in advance.

The height here is about 8,000 feet; climate clear, invigorating, and bracing.

Although there is no ailment of any moment, yet a large number of fighting men and followers are inefficient from trivial causes, especially from sore feet.

Recommended that the Kahars and all followers rations should be supplemented by 4 ounces of fresh meat daily.

"Rouse" at 2.45 a.m., marched at 4 a.m. over the Sher-u-dana Pass (9,000 feet high) into the Guzni Plain over which we found an excellent road leading to the city and fort.

Guzni, 12½ miles
15th August.

The leading brigade arrived at 9.30. The encampment was formed on a wide plain facing the fort and city. Good water and a large supply of fruit and vegetables were found here and much enjoyed by all arms.

The marches have been so long that the brigade on rear guard seldom reaches camp till late in the afternoon, sometimes after dusk. The camp followers are then so worn, fagged, and exhausted that they are unable to cook their food, and content themselves with some uncooked *atta* and Indian corn. These remarks equally apply to the Goorkhas who also cook their own food. To this deprivation may be ascribed a large amount of the inefficiency resulting from dyspepsia and bowel affections.

It was found necessary to purchase here a large number of donkeys to carry the weary and footsore.

Moved off at 4.30 a.m. A long dreary march of 20 miles, the greater part over shifting fine sand. A large number of all ranks fell out. Some marched without their accoutrements, which were carried in dandies; others rode on mules, ponies, and donkeys; others, again, walked and rode in turns, one mule doing duty, perhaps, for three men.

Zughatta, 20
miles, 16th
August.

The duties of the medical officer attached to the field hospitals are on these marches of a most laborious and anxious description. To them are entrusted each morning the care and conveyance of the sick of the force, European and Native. The physical labour and mental worry experienced daily in getting these establishments under weigh in the early morning can be readily understood.

Towards 5 p.m. a blinding dust-storm sprang up, which almost stopped the progress of the brigade on rear guard (1st Brigade). This brigade did not get into camp till 9 p.m.! Imagine the condition of men and animals on the march since 4.30 a.m. Few of these men have energy left to enable them to set about cooking their food. Strange as it may seem, the troops marched on jauntily, bands playing.

It has been the most trying march yet experienced, and the number of cripples has so largely increased more donkeys were purchased for their conveyance.

Probably a worse shod army never took the field. The ammunition boot, made of raw material and of very indifferent workmanship, loses shape and turns over at the heels on one side or the other after a few days' hard marching, and

simply impedes progress. The Native shoe, with its wide open mouth and narrow pointed toes, seems ingeniously contrived to cripple and blister.

The little Goorkha, who is very fond of the British soldier, invariably adopts the ammunition boot, but as his foot occupies about half the boot, I do not think he is a gainer by the transaction. The subject of boots deserves serious attention.

To-day we marched over the battle field of Ahmed Khel. It is about two miles from our present encampment. Freshly-made graves mark the site on the arid, bleak, and stony plain. The graves of our countrymen (four) were, I saw, torn open. There was a scarcity of good water on this march. Many weary hours were spent in the scorching sun waiting for tents and baggage, for there is neither tree nor shrub to be seen on the wide horizon, and this may be said of every encamping ground from Gazni to Kandahar. Indian corn in large quantities here.

Off at 4.30 a.m., over a stony plain, through which ran streams and keraises of clear water at frequent intervals.

Few fresh men fell out to-day, and the condition of the Europeans is improving.

Marched at 4.30 a.m., over the same sort of dreary waste. The ground for marching, however, was good, and water was plentiful. Very few Europeans fell out.

Encamped close to several villages, from which were obtained grain, *atta*, fowls, and in the neighbouring fields there was no lack of lucerne, clover, and Indian corn. Here I recommended that one tin of Kopf's soup between two men should be issued daily to the Europeans; that their rations should be increased to 1 lb. 8 oz. of fresh meat daily; that each Native soldier and camp follower should have eight ounces of fresh meat daily in addition to his rations.

Moved off at 4.30 a.m. The three brigades marched abreast, protected on the flanks by the cavalry. The 1st Brigade kept the road and directed; on either side marched the 2nd and 3rd. The ground over which the 3rd Brigade marched was of the worst description, being cut up into small fields bounded by irrigating ridges and channels, and frequently intersected by deep nullahs. Water, too, was unusually scarce; there was none for at least 11 miles.

1st and 2nd Brigades reached camp about 11 a.m.; 3rd not till 2.30 p.m. This, though only 14½ miles, was, from the rugged nature of the ground and the long stretch without water, the most distressing march of all, especially so to the kahars, drivers, and baggage animals. No deprivation is so distressingly felt on a hot dusty march by men and animals as the want of water.

Marched at 4.30 a.m. The same order was observed, the country being wide and open. Deep nullahs were of frequent occurrence. Good water at short intervals, and a most refreshing breeze. Although the distance travelled to-day was 21 miles, yet its effect on men and animals was not by any means so distressing as the march of yesterday.

The number of ineffectives has been daily increasing, and since leaving Gazni there have, on an average, been about 550 fighting men and 150 to 200 followers daily on the non-effective list. The ailments in the large majority are trivial, sore and blistered feet, slight diarrhoea, sun fevers, and many are simply fagged.

The mutton and *atta* obtained locally have been very good.

Melons of a good description and just ripe have been procurable all along, and have been immensely enjoyed by the troops at the end of their long dusty marches.

Marched at 4 a.m., 3rd brigade leading on main road. Occasional patches of vegetation and frequent supplies of water conducted by keraises from the river Taruak across the arid plain.

The kahars and other followers are greatly knocked up; about 270 of them are being carried to-day, chiefly on ponies and donkeys; 550 men on the non-effective list.

"Rouse" at 1 a.m. Marched at 2.30, over a very stony uneven road and across several deep nullahs.

Three Native soldiers died since leaving Cabul from obstruction of the bowels, reported to have been caused by eating raw Indian corn and drinking

Chardeh, 13
miles, 17th
August.

Oba-Karez, 16½
miles, 18th
August.

Mukur, 14½
miles, 19th
August.

Prenjuk near
Akojau, 21 miles,
20th August.

Garjin, 18 miles
21st August.

Babakajai, 16½
miles, 22nd
August.

immediately before or afterwards large quantities of water. Undoubtedly several cases of colic amongst men and animals have been due to these causes. 564 fighting men and 319 followers non-effective.

Marched at 2.30 a.m., over a rough stony country and across some ugly nullahs. Water abundant and good. Encamped on a plain to the west of the Fort. Water, fruit, and vegetables in quantities. Kelat-i-Ghilzai, 16½ miles, 23rd August.

Halt for the day; a rest much needed. The Native troops, followers, and baggage animals are much fagged and exhausted from want of sleep and regular meals. The Europeans stand the privations and hard work much better. Kelat-i-Ghilzai, 24th August.

Two hundred and thirty-two miles have now been accomplished in 15 successive days, an average of $15\frac{1}{5}$ miles per day.

On this day an inspection of the whole force was held, and in Appendices A. and B. will be found the number, by regiments, of fighting men and followers non-effective; also the died and missing since leaving Cabul.

Sir F. Roberts visited all the sick and weakly in the afternoon. Blistering of the feet caused about one half the inefficiency. The poor kahars and other followers suffer greatly from suppurating sand cracks of the feet.

I am of opinion, taken all round, the wide soled ammunition boot is best adapted for both European and Native troops, but the material and workmanship must be improved, and decided attention to fitting is demanded. It is noteworthy that about 14 or 15 miles were accomplished on this march with comparative ease, but that every yard over that distance told with undoubted force.

Marched at 2.30 a.m., accompanied by the garrison of Kelat-i-Ghilzai, consisting of two guns of 1/C Royal Artillery, two companies of 66th Regiment, 2nd Belooch Regiment, and Scinde Horse. Jalduk, 18 miles, 26th August.

The road, at first overhanging the Turuak River, is narrow and interrupted by dry watercourses. Nothing is so distressing to men and animals as the crossing of these deep nullahs. Happily the road soon widened, a refreshing breeze sprang up, and the march was well finished before the sun had any strength.

Off at 2.30 a.m., the road at first narrow, presently opens on a wide plain. The 5th Goorkhas lead, and the march is not over two miles an hour. Tirandaz (1 mile beyond Minar), 15 miles, 26th August.

The column is now marching in fighting order, and all baggage, field park, and field hospitals are in rear of the last brigade. The interruptions on the road to-day were numerous and bad. The baggage animals were under their loads for 12 hours.

The 92nd Highlanders and 2/60th Rifles are daily improving in their marching, while the 72nd Highlanders has rather fallen off. The large proportion of young soldiers in this regiment swells its non-effective list.

Encamped on a plain overhanging the Taruak. Every ditch and nullah seem filled with the skeletons of Sir Donald Stewart's camels.

Marched at 2.30 a.m., 24th Punjab Native Infantry leading. Road passed over a smooth plain, and afforded good walking. Pace so fast that it distressed Goorkhas greatly. Sir F. Roberts started to-day with the intention of riding to next camp, namely Robat, but was prevented from doing so by an attack of fever. Khel-i-Khun, 17 miles, 27th August.

Here again we pitched tents on the banks of the Taruak.

The 15th Sikhs leading, moved off at 2.30 a.m., along a narrow road skirting the base of the hill. It soon emerged on a wide open plain. Water at frequent intervals; though turbid, it is well flavoured and cool. This march was successfully accomplished, and very few men fell out. Yesterday afternoon the whole force was medically inspected, the sick and non-effective of fighting men and followers weeded out. The sick and weakly men ordered to march from Khel-i-Khun to "Poti," distant about six miles, at 5 a.m., escorted by the Khelat-i-Ghilzai garrison, under command of Colonel Tanner, encamp there for the night, and march next morning for Robat. Robat, 20 miles, 28th August.

Halt for the day. Colonel Tanner with non-effectives arrived at 9 a.m.

An issue of ounce of lime juice per man daily recommended.

Marched at 3.30 and arrived at next camping ground early.

Here we found extensive melon beds.

The halt of yesterday has been of great benefit.

Robat, 29th August.

Mhomund, 7 miles, 30th August.

Kandahar, 11
miles, 31st
August.

Marched off at 2.30 a.m. over a bleak sandy plain with patches of vegetation. No scarcity of water. Leading brigade arrived at 7 a.m.

The non-effectives of Europeans and Natives numbering 1,000 were at once admitted to the hospitals in the city of Kandahar.

The numbers noted opposite each Regiment and department in Appendices A. and B. represents pretty accurately the admission into the field hospitals at Kandahar on the 31st August. Deputy Surgeon-General O'Nial took charge of the Europeans, the medical attendance of the Natives was provided from the Bengal force.

The troops and baggage animals remained in the open plain in a scorching sun till late in the afternoon waiting for the site of the camp to be determined. The difficulty was due to the want of water which had been cut off for some days by Ayub Khan. There was plenty of good water in the city, but this would not meet the demand for the animals.

The distance from Guzni to Kelat-i-Ghilzai, 136 miles, was made in eight consecutive days, an average of 17 miles per day.

Robat, within striking distance of Kandahar, was reached on the 20th March, an average of 15 miles per day, including one day's halt at Kelat-i-Ghilzai. The length of the daily marches performed conveys a very inadequate idea of the strain and physical endurance required for their accomplishment.

The character of the country is an important item to be borne in mind.

The valleys traversed were not only repeatedly cut up by deep nullahs, but the plains themselves were mapped out in little patches (sites of former cultivation), each little field or patch about 10 or 15 feet square, bounded by a ridge and irrigating channel. Nothing on this march contributed so largely to harass, distress, and fag both men and animals than the frequent crossing of these nullahs and patches.

There was only one day's issue of preserved meat. It was not required, as mutton of the best quality was procurable all along in quantities required.

All the preserved meats that have hitherto come under my observation for issue to the troops are well adapted for short expeditions of two or three days. If continued longer indigestion, dyspepsia in all its phases, diarrhoea, invariably result.

Kopf's soup proved of great value as an extra to the daily rations. By some it was taken in the early morning before marching, by others on arrival at next camp.

In my opinion, it should be issued as an extra and not in lieu of any portion of the ration when hard work has to be done. It is a mistake to suppose it is as satisfying or contains the sustaining powers of good solid meat. It is invaluable if issued as an extra between meals or before marching.

Useless to say the daily issue of a large ration of excellent mutton to the native soldiers and camp followers maintained the stamina of these men and enabled them to go through a day's work, which otherwise would have prostrated them on the roadside.

The departmental arrangements contained in Appendix C. were circulated some days ago amongst general commanding and departmental officers with the force.

This afternoon a body of cavalry and infantry made a reconnaissance to the westward with the view of gaining information of the country and enemy's position thereabouts. This body on its retirement was followed up by the enemy within a few hundred yards of the cantonments. Several shells have been dropped into cantonments from the Baba-Wali Pass, and some of our animals killed.

1st September.

At 6 a.m. the generals, commanding officers, and heads of departments assembled at Sir F. Roberts' quarters, and heard from the Lieutenant-General an explanation of the plan of attack illustrated by a capital map by Major Leach, R.E. (V.C.).

As this action will be far better and more graphically described by the special correspondents with the force than lies in my power, I shall confine myself to medical aspects.

The scene of the action was so close to cantonments it was not necessary to move out the field hospitals. B. and F. sections were pitched in the head-quarter enclosure, section A. in an enclosure about 200 yards distant. Surgeon-Major Jackson, A.M.D., and two medical subordinates were ordered

to take charge of the field hospitals and make arrangements for the reception of the wounded. In the afternoon they were assisted by two medical officers and two medical subordinates of the Bombay force.

Deputy Surgeon-General O'Nial placed at my disposal accommodation for 45 European patients in the field hospital of the citadel.

The Lieutenant-general commanding and head-quarter staff took up a position on a rocky eminence known as *Karez Hill*. This commanded a complete view of the plain between it and the *Baba-Wali Pass*, the enemy's main position, where five of his guns were placed. The action commenced a little after 9 a.m. by the 1st brigade advancing and eventually capturing the mud village of *Gaudi-Mulla-Sahibdad*. Simultaneously the 40-pounders opened fire on the *Baba-Wali Pass*, and 6/2 Royal Artillery and screw battery on the mud village just named, covering the advance of the 1st Brigade. During these movements several men of the 92nd Highlanders and 2nd Goorkhas were killed and wounded. Surgeon-Major Roe, 92nd Highlanders, formed a dressing station at this village. Here the wounded of the brigade were hastily dressed and despatched to the field hospital.

In the meantime the brigade advanced over the plain towards the shoulder of the *Pir Paimal* Mountain, driving the enemy before them from the enclosed gardens and canals. The 2nd brigade also advanced about the same time from the left of *Karez Hill* over a plain thickly set with willow trees, enclosed gardens, and canals towards the same shelter. As the distance travelled by the 1st brigade was shorter than that of the 2nd Brigade, the former rounded the shoulder first, and in doing so encountered some very heavy firing, and several men were dropped. The 2nd Brigade in rounding the shoulder took a much wider sweep, and thus fell some considerable distance behind the 1st.

The screw battery accompanied the latter. Both brigades advanced rapidly up the valley, the first, bugging the mountain at *Pir Paimal* village, advanced at almost a double towards the entrenched camp near the *Baba Wali Pass* and captured it in the most gallant form.

The advance of the 1st Brigade at this time was so rapid and the ground so swampy the screw guns had not time to come into action before the enemy's position was stormed.

In the meantime the 2nd Brigade moved up the centre of the valley and opposite the village of *Pir Paimal* met the enemy in large numbers. Here poor Colonel Brownlow, 72nd Highlanders, riding a conspicuously white Arab horse at the head of the regiment, was shot dead by a volley from a loop-holed village. Here, too, Captain Frome and several men of this regiment were killed and wounded. In fact, hereabouts the 72nd met with almost all their casualties.

The dressing station was pitched close by under some trees.

The dressing station for the 1st Brigade was formed also in a clump of trees. There was no lack of water as the canals were filled to overflowing.

Directly the 1st and 2nd Brigades rounded the *Pir Paimal* Mountain Sir F. Roberts advanced the 3rd Brigade (in reserve), but by the time it arrived at the entrenched camp the action was over and the day won.

The spare bearer carriage of the 3rd Brigade was at once ordered to the dressing stations and the wounded when dressed despatched under escort to the field hospitals.

As soon as the entrenched camp was taken by the 92nd Highlanders the stampede from the *Baba-Wali Pass* of a heterogeneous mass became fast and furious, and as we marched up the valley immediately afterwards towards the village of *Baba-Wali* the road and valley were blocked with deserted guns, camp equipage, quantities of ammunition, grain, and forage.

On the road between the village of *Baba-Wali* and *Muzra* we met the dead body of poor MacLaine, Royal Artillery, who had been made a prisoner at Burrows' action on 27th July last. I dismounted and examined the body. He had a clean incised wound of the neck which all but severed the head from the body. His death could not have taken place more than half an hour before I saw him.

The large number of sick admitted to the field hospitals in the citadel on 31st August have long since rejoined their respective regiments, and the great majority have returned to duty.

APPENDIX A.—RETURN of STRENGTH, CASUALTIES since leaving CABUL, NUMBER of SICK in each CORPS of INFANTRY on arrival at KELAT-I-GHILZAI and KANDAHAR.—Kandahar, 1st September 1880.

Corps.	Strength.	Casualties since leaving Cabul, 24th inclusive.			Casualties reported between 24th and 31st August.			Total Casualties between Cabul and Kandahar.		Medical Officers' Names.
		Died.	Missing.	Sick.	Died.	Missing.	Died.	Missing.		
6/8 Royal Artillery	100	—	—	3	—	—	—	—	Officiating Deputy Surg.-Gen. J. Ekin.	
Native soldiers	142	—	—	6	—	—	—	—	Surgeon H. Fenn.	
Kahars	59	—	2	10	—	—	—	2		
Other followers	267	1	1	25	—	—	1	1	Surgeon-Major S. B. Roe.	
92nd Highlanders	649	—	—	14	—	—	—	—		
Kahars	206	1	1	39	—	—	1	1	Surgeon A. Hamilton.	
Other followers	280	—	—	28	2	—	2	—		
23rd Pioneers	700	1	—	58	1	—	2	—	Surgeon H. J. Linton.	
Kahars	105	—	—	10	—	—	—	—		
Other followers	227	1	—	3	—	—	1	—	Surgeon-Major W. Finden.	
24th Native Infantry	575	—	2	50	—	—	—	2		
Kahars	110	—	—	7	—	—	—	—	Surgeon-Major E. Hopkins.	
Other followers	178	—	—	47	—	—	—	—		
2nd Goorkhas	503	1	—	18	—	—	1	—	Surgeon-Major G. W. McNalty.	
Kahars	81	—	—	8	1	—	1	6		
Other followers	178	—	6	4	1	—	1	2	Surgeon-Major G. W. McNalty.	
"A" section, Field Hospital.	156	—	2	26	—	—	—	—		
Commissariat followers.	69	—	2	—	—	—	—	2	Surgeon-Major G. W. McNalty.	
Engineer Park followers.	97	—	4	4	—	—	—	4		
2ND BRIGADE.										
72nd Highlanders	775	1	—	62	1	—	2	—	Surgeon-Major J. A. Atkins.	
Followers	277	1	—	34	—	—	1	—		
Kahars	220	1	—	—	—	—	—	—	Surgeon J. A. Nelis.	
2nd Sikhs	615	—	—	27	1	—	1	—		
Other followers	108	—	—	6	1	—	1	—	Surgeon F. W. Wright.	
3rd Sikhs	205	—	—	5	1	—	1	—		
Kahars	556	1	—	67	—	—	1	—	Surgeon W. Coates.	
Other followers	84	1	1	8	—	—	1	1		
5th Goorkhas	184	—	—	12	1	—	1	—	Surgeon A. W. McKenzie.	
Kahars	561	—	—	38	—	—	—	—		
Other followers	70	—	—	13	—	—	—	—	Surgeon-Major W. F. Bennett.	
No. 2 Mountain Battery.	195	—	4	22	—	—	—	4		
Kahars	226	—	—	11	—	—	—	—	Surgeon-Major M. Cotton.	
Other followers	51	—	2	2	—	—	—	2		
"B" section, Field Hospital.	151	—	—	4	—	—	—	—	Surgeon-Major J. Oughton.	
Transport Department.	117	—	7	19	—	—	—	7		
Ordnance Park	—	—	—	—	—	—	—	—	Surgeon-Major G. C. Chesnayne.	
	413	1	—	40	—	—	1	—		
3RD BRIGADE.										
11/9 Royal Artillery	205	—	—	10	—	—	—	—	Surgeon-Major E. W. Cunningham.	
Kahars	54	—	—	10	1	—	1	—		
Other followers	127	—	—	12	—	—	—	—	Surgeon J. Mulane.	
2/60th Rifles	670	—	—	20	—	—	—	—		
Kahars	169	1	1	20	—	—	1	1	Surgeon-Major E. C. Markey.	
Other followers	319	—	4	8	—	—	—	4		
15th Sikhs	653	1	—	31	—	—	1	—	Surgeon-Major J. Brodie.	
Kahars	101	—	—	12	—	—	—	—		
Followers	221	—	—	16	—	—	—	—	Surgeon-Major E. C. Markey.	
4th Goorkhas	637	—	1	56	—	—	—	1		
Kahars	214	1	—	25	2	—	3	—	Surgeon-Major J. Brodie.	
Followers	221	1	—	22	1	—	1	—		
25th Native Infantry	634	—	—	47	—	—	—	—	Surgeon-Major E. C. Markey.	
Kahars	104	—	—	12	—	—	—	—		
Followers	179	—	—	6	—	—	—	—	Surgeon-Major J. Brodie.	
"F" section, Field Hospital.	104	—	—	1	—	—	—	—		
Brigade Staff followers.	30	—	—	—	—	—	—	—	Surgeon-Major J. Brodie.	
Commissariat and Transport followers.	96	1	3	—	—	—	1	3		
	—	15	43	1,037	14	—	29	43		

	Up to 24.	24 to 31.	Total.	Infantry.
Deaths, European -	- 1 -	- 1 -	- 2 -	Total deaths - 29 Reported missing - 53
" Sepoy -	- 4 -	- 2 -	- 6 -	
" kahars -	- 5 -	- 5 -	- 10 -	
" followers -	- 5 -	- 6 -	- 11 -	
Missing -	- 43 -	- - -	- - -	Cavalry.
			29	Followers, died - 5
				Missing - 7

APPENDIX B.—RETURN OF STRENGTH, CASUALTIES since leaving CABUL, NUMBER OF SICK IN CAVALRY BRIGADE on arrival at KANDAHAR.—Kandahar, 1st September 1880.

Corps.	Strength.	Casualties since leaving Cabul.		Unfit to join Fighting Ranks.	Medical Officer.	Remarks.
		Died.	Missing.			
9th Lancers -	317	—	—	7*	Surgeon-Major R. Lower. Surgeon-Major D. F. Keegan. Surgeon W. Palmer. Surgeon J. Duke.	*In Field Hospital.
C. I. Horse -	433	—	—	6		
3rd Bengal Cavalry.	394	—	—	17		
3rd Punjab Cavalry.	448	1	—	23		
	1,592	1	—	53		

Corps.	Regimental followers.			Kahars.			Transport Department.			Commissariat Department.			Total.		
	Casualties.			Casualties.			Casualties.			Casualties.			Casualties.		
	Strength.	Died.	Missing.	Strength.	Died.	Missing.	Strength.	Died.	Missing.	Strength.	Died.	Missing.	Strength.	Died.	Missing.
9th Lancers -	320	1	-	52	-	-	11	116	-	3	6	24	-	1	-
Central Indian Horse -	376	-	2	34	-	-	-	57	-	1	-	-	-	-	2
3rd Bengal Cavalry -	273	-	9	72	-	-	1	73	-	4	-	-	-	-	-
3rd Punjab Cavalry -	389	4	1	97	-	-	11	88	-	7	-	-	-	4	1
Head-quarters and Staff, Cavalry Brigade.	32	-	-	-	-	-	-	3	-	-	-	-	-	-	-
Ditto, Commissariat -	-	-	-	-	-	-	-	2	-	-	11	-	-	-	-
	1,389	5	3	17	255	-	23	330	-	3	18	35	-	1	-
														5	7
															58

APPENDIX C.—MEDICAL ARRANGEMENTS to be observed when an ENGAGEMENT with the ENEMY is expected.

1. The brigade-surgeons will establish dressing stations for Europeans and natives of their respective brigades at the places pointed out by the brigadiers-general as near to the fighting line as is conformable with safety, and the dressing stations of the Europeans and Natives should be close together so that assistance may be readily rendered from one to the other.

2. The medical officers in charge of sections of field hospitals will remove part of these establishments fully equipped to the dressing stations.

3. One medical officer attached to European troops, and one medical officer attached to native troops will remain in camp to take charge of all sick and make arrangements for the reception of the wounded. These officers will be detailed for these duties by the deputy surgeon-general, infantry division.

4. The brigade-surgeons will organise stretcher parties for the removal of the wounded to the dressing stations under the junior medical officers and such number of medical subordinates as they may consider necessary to meet the demands.

5. All medical officers should carry on their persons or in their wallets or saddle bags means of performing a first dressing and meeting an emergency.

6. The dressing stations will be well supplied with hot and cold water, medical comforts, &c.

7. The medical officers of native regiments will take with them a proper supply of medical and surgical appliances, medical comforts, their medical subordinates, cook, bhistee, and dresser for each regiment. From these the brigade surgeons will form the dressing establishments for native troops.

8. Each battery and regiment will be accompanied by its sick bearer carriage.

9. The deputy surgeon-general of the infantry division will supervise all arrangements connected with his division and the artillery attached to it, and during an action with the enemy will move the medical officers and stretcher parties from place to place where their services are most urgently required.

(Signed) J. A. HANBURY,
Principal Medical Officer, K.F.F.

Guzni,
5th August 1880.

APPENDIX No. VI.

**CASE OF TRAUMATIC TETANUS TREATED BY CALABAR BEAN,
1880.**

By Surgeon-Major S. KYLE COTTER, M.D.

No. 1,969. Private T. H. C., 19th Hussars. Aged 19. Service 9/12 years.

This man, able-bodied and well grown, received a lacerated wound across the pulp of left thumb, close under the nail, on 4th February 1880, by being caught between the edge of the stable manger and the headstall chain. The wound seemed of no importance, and was treated by water dressing, to which, on third day, carbolic acid was added. Nothing peculiar was observed up to 19th February, when he complained of want of sleep, for which 10 gr. chloral were given at bedtime.

Feb. 20th.—Slept indifferently; chloral increased to 20 gr.

Feb. 21st.—Slept fairly; continue chloral at bedtime.

Feb. 22nd.—Mixt. senna co. ʒij.; continue night draught.

Feb. 23rd.—Senna acted mildly; continue chloral.

Feb. 24th.—Repeat senna. Begins to-day to complain of stiffness of lower jaw, and pain in its condyles in eating; pupils slightly dilated; pulse 116 and small; some anxiety expressed in face; complains of pain in epigastrium, and that his "back feels stiff." Temp. 98°. Chloral continued.

Feb. 25th.—A blister applied last night to epigastrium, and dressed with morphia, 4 gr. to 3i. simple ointment. Enema terebinth given. The face looks more anxious, and there is some risus sardonicus, with tonic spasm of corrugatores supercilii; teeth close, but not locked; a slate pencil can be inserted between them, due to the fact that the under jaw is drawn a little back; attempts to open them causes much pain and an audible snap, with increased anxiety. Milk diet and beef tea sucked in, and as the symptoms are asthenic, the mixt. Vini. Gallici, B.Ph., given at intervals; complains of numbness in the fingers; temp. 98° ; pulse as before, but weaker. Ordered chloral, 10 gr., every fourth hour. In the afternoon the extract of Calabar bean was obtained, and given in $\frac{1}{2}$ gr. doses every third hour, chloral being omitted.

Feb. 26th.—Jaws seem somewhat less rigid; pulse 92 and small; left pupil natural, right dilated; much painful stiffness in back of neck and sternomastoids; considerable depression and anxiety. A blister to nape of neck, and morphia dressing.

Feb. 27th.—Calabar extract every two hours in $\frac{1}{2}$ gr. doses; jaws more locked and rigid to-day; pupils natural and contractile; pulse 92 and beady; temp. $98^{\circ} \cdot 2$; $\frac{3}{4}$ enema terebinth stat.; ordered chloral and pot. bromid. aa 20 gr. at bedtime. During this day there occurred three spasmodic seizures, with opisthotonos, and numbness of all the fingers and toes, with tingling. The decubitus is always dorsal, with the legs stiffly extended. The spasmodic fits lasted a minute or two, but were shortened by inhalation of from 3 gr. to 3i. of chloroform, which quickly produced perfect quiet. In the evening the teeth were closer, and he had a very violent convulsion. Still sucks fluid nourishment.

Feb. 28th.—Three severe convulsive attacks during night with opisthotonos, got under by inhalation of chloroform in about a minute; pupils natural and contractile; pulse 98, and softer. Two slight spasms during day; sleeping draught nightly; Calabar as before.

Feb. 29th.—Slept well, and had no spasms; jaws as before, and much pain in endeavouring to open them; tingling of fingers, and profuse perspiration; pupils natural; urine natural throughout; Calabar taken regularly whilst awake.

March 1st.—Jaws somewhat less rigid; pulse 92, and soft; temp. $96^{\circ} \cdot 6$; neck very stiff; decubitus dorsal; no numbness or tingling; had one slight spasm during day, and pain in thyroid cartilage; considerable *fœtor* of breath; tongue of course cannot be seen; $\frac{3}{4}$ enema terebinth stat.

March 2nd.—A quiet night, with one slight spasm, and one similar this morning. He is vividly sensitive to the smallest excitement or noise, and is therefore kept in a small ward, with a special attendant, since 25th February. Pulse 104, and small; temp. $97^{\circ} \cdot 3$; pupils natural; repeat enema daily. In the evening the temp. was $98^{\circ} \cdot 4$, and one slight spasm occurred; enema acted fully; continue sleeping draughts.

March 3rd.—Temp. $98^{\circ} \cdot 6$; pulse 86, and good in character; teeth not so close; pot. bromid. 20 gr. twice a day, and night draught as before; continue Calabar extract. A short and slight spasm during day.

March 4th.—Temp. and pulse natural; two sharp convulsions during night, restrained by chloroform; had some spasmodic working of hands and spinal muscles even during sleep; no attacks during day. Ordered enema tabaci, B.Ph., at 2 p.m., and repeated at bedtime.

March 5th.—Several spasmodic attacks during sleep, waking him up. In the afternoon the dose of Calabar was changed from $\frac{1}{2}$ gr. every two hours to $\frac{1}{3}$ gr. every third hour. The enema terebinth. has to be given daily, owing to obstinacy of the bowels; it brings away one or two motions.

March 6th.—Temp. and pulse natural; two slight spasms during night; no attack during day. Enema tabaci but once daily.

March 7th.—No spasm; pupils natural and contractile; temp. $97^{\circ} \cdot 5$; pulse 84. Complains of feeling giddy after enema tabaci; it is omitted.

March 8th.—Marked improvement in distension of jaws, and the legs are occasionally flexed. Temp. and pulse natural, and no spasms during night or day.

March 9th.—Opens jaws wider; no pain in the spinal muscles, epigastrium, or larynx.

March 10th.—Since development of tetanic symptoms on 25th Februar the thumb has been very painful and sensitive to touch; carbolic dressing used throughout. The wound is slow to heal. Temp. $97^{\circ}\cdot 2$; no spasms.

March 11th.—No spasms; teeth as before, admitting a lead pencil; digastric retraction of under jaw continues. Quinia sulph. 1 gr. added to each dose of Calabar. He sleeps a good deal, and misses some doses.

March 12th.—State of jaws improved; tongue can now be seen to small extent, which is clean; no spasms or tingling; pupils natural; temp. 97° ; pulse 92; evening temp. 98° ; pulse 80.

March 13th.—Thumb-nail fell off this morning, and the tenderness in the wound and finger has ceased; no spasms; temp. and pulse natural.

March 14th.—Morning and evening temp. $97^{\circ}\cdot 8$; improving.

March 15th.—Same observations.

March 16th.—Temp. $97^{\circ}\cdot 6$; pulse 86; no spasms; jaws open wider; chloral omitted, but pot. bromid. continued at night. Extract of Calabar increased to 1 gr. every third hour.

March 17th.—Tongue can now be seen; it is clean; no spasms; temp. and pulse natural.

March 18th.—Not quite so well, and complains of giddiness; vomited his breakfast; tongue clean; temp. 97° . Resume $\frac{1}{2}$ gr. doses of Calabar with the quinine, as before. Jaws open fairly.

March 19th.—Can open jaws to near natural extent; temp. 98° .

March 20th.—Expression of anxiety gone; to sit up in an arm-chair for a short time.

March 21st.—Up for some hours in the arm-chair.

March 22nd.—Calabar bean stopped; continue pot. bromid. at bedtime.

March 23rd and 24th.—Same favourable report.

March 25th.—Opens jaws to near natural extent, and without pain; can read and sit up for several hours.

March 27th.—Now that he tries to stand, spasmodic tension of long extensors of feet is noticed.

March 29th.—To take pot. bromid. 20 gr. three times a day; the last at night having chloral 10 gr. added.

April 1st.—Has had enema terebinth daily heretofore; it is now omitted, and pil. colocynth co. 5 gr. ordered every night.

April 2nd.—Some contraction of extensors of feet continues; up nearly all day. Chicken diet to-day.

April 3rd.—The two doses of pot. bromid. omitted during day, but that with chloral at night continued. He is able to walk in the garden.

April 5th.—Mixt. Vini. Gallici omitted, and amount of beef tea lessened. Has some difficulty in raising his legs coming upstairs.

From this date he improved uninterruptedly, and was discharged on 10th May. The total amount of Calabar bean extract used was 70 grains, or about 3 grains daily.

APPENDIX No. VII.

REPORT OF A CASE OF SUDDEN DEATH THE RESULT OF A KICK BY A PONY AT PRETORIA, TRANSVAAL, 14th June 1880.

By Surgeon ARTHUR HARDING, A.M.D.

HISTORY.—No. 1824, Private J. Coyle, 2/21, R.'S. F., an officer's servant, in driving away a pony from the vicinity of his master's tent, received a kick from the animal over the region of his liver; he at once said to a comrade standing near him, "I'm done for," and fell down apparently dead.

A man was immediately sent to the hospital for medical assistance, and on my arrival at the scene of the accident about five minutes after I found life to be extinct.

The man was lying on his back, with his head supported in the arms of a comrade, the eyelids closed, with pupils widely dilated, the lips blue, and face somewhat blanched, on auscultation no heart or breath sounds were audible.

The usual remedies, viz., stimulants, artificial respiration, friction, &c., having been tried without avail, the corpse was removed to the mortuary.

AUTOPSY.—Twenty-two hours after death.

External Appearances.

The body was that of a well nourished muscular young man of about 20 years of age; considerable mottling of skin was present; a faint discolorization like a bruise could be detected at seat of blow.

Head.—Not examined.

Thorax.—On opening the chest the lungs were found to be collapsed, and healthy in appearance; there were slight adhesions of old standing on right side.

The heart was normal, and contained a quantity of dark blood in a perfectly fluid state.

No fracture of ribs or other injury to any of the organs contained in the thorax could be detected.

Abdomen.—There was no injury to the parietes or any of the viscera.

The liver was uninjured, normal in size and appearance, but on being cut into was found to be full of blood which flowed freely from it on section.

Kidneys normal and also full of fluid blood.

Spleen do. do.

The stomach was uninjured, and contained a small quantity of semi-digested food.

The intestines showed no sign of rupture or other injury.

REMARKS.—The history and post mortem appearances of this case apparently point to sudden death, the result of shock to the sympathetic system of nerves paralysing the cardiac plexus, and thus causing cessation of the heart's action.

The man, as far as can be ascertained by inquiry of his intimate comrades and examination of his medical history sheet, had been previously perfectly healthy, thus excluding heart disease, and no traces of injury being found, lead fairly to the above conclusion.

As the authenticity of this case, owing to the circumstance of its happening in a military camp, surrounded by competent and trustworthy witnesses, and the vicinity of the station hospital admitting of almost immediate medical attendance, coupled with the facilities of post mortem examination afforded by military service, render it in my opinion a valuable record on the subject, and as Mr. Pollock, in his article of "Injuries of the Abdomen," in Holmes' System of Surgery, apparently throws some doubt on the few recorded cases of like injuries, I have ventured to forward this report.

APPENDIX

Annual Abstract of Meteorological Observations taken

NETLEY.

Lat. 50° 51' N.

Month.	Mean Pressure.	Air Temperature.										Tension of Vapour.	Relative Humidity.		
		Hourly Means.		Daily Means.		Means of		Abs. Min.		Abs. Max.			Mean.	Minimum.	
		9 a.m.	9 p.m.	Simple.	Reduced.	Min.	Max.	Temp.	Day.	Temp.	Day.				
January -	29°998	34.2	—	—	—	28.1	39.9	15.5	12th	50.8	3rd	166	84.6	45.0	11th
February	29°555	40.0	—	—	—	34.2	45.4	25.0	24th	51.8	11th	222	79.2	64.0	25th
March	29°993	43.8	—	—	—	34.5	51.0	26.0	2nd	61.3	9th	238	81.6	68.0	11th
April	29°503	47.6	—	—	—	36.3	54.5	27.0	12th	60.8	27th	266	80.3	40.0	28th
May	30°001	52.3	—	—	—	42.5	61.3	29.0	10th	69.7	24th	310	76.7	40.0	5th
June	29°778	59.8	—	—	—	51.4	65.5	42.1	4th	72.8	13th	436	84.4	65.0	5th
July	29°780	60.1	—	—	—	53.0	68.4	48.1	26th	79.8	20th	449	88.0	59.0	5th
August	29°842	63.4	—	—	—	54.2	70.1	47.1	30th	79.3	12th	484	69.5	59.0	6th
September	29°963	60.2	—	—	—	48.6	63.6	40.0	26th	73.0	6th	444	86.6	63.0	1st
October	30°068	53.0	—	—	—	34.1	59.2	31.0	16&17	68.7	6 & 7	355	85.4	71.0	18th
November	30°184	40.2	—	—	—	33.4	46.5	19.5	16th	57.3	18th	206	81.2	55.0	23rd
December	30°310	33.8	—	—	—	25.8	41.5	15.0	7th	52.8	31st	154	81.2	50.0	2nd
Mean	29°917	49.0	—	—	—	39.6	55.5	30.4	—	64.9	—	310	81.5	56.5	—

GIBRALTAR.

Lat. 36° 6' 20" N.

January -	30°003	54.1	—	—	—	49.9	62.5	42.9	2nd	67.4	22nd	349	82.0	61.0
February -	30°066	54.2	—	—	—	50.0	63.0	38.2	27th	70.3	8th	356	83.0	53.0
March -	30°005	55.0	—	—	—	51.0	64.9	40.0	1st	73.4	14th	389	85.0	65.0
April -	30°017	58.1	—	—	—	53.5	67.8	48.17	10th	78.8	30th	391	80.0	49.0
May -	30°032	63.5	—	—	—	58.0	75.5	53.5	10th	84.8	31st	475	82.0	61.5
June -	30°022	69.6	—	—	—	64.0	82.3	59.8	8th	90.5	24th	507	83.0	76.0
July -	29°997	74.1	—	—	—	69.3	87.2	63.8	2nd	95.1	13th	599	83.0	78.0
August -	29°871	77.4	—	—	—	71.2	86.4	66.2	14th	90.2	18th	746	78.0	44.0
September -	30°031	70.2	—	—	—	62.0	78.9	54.5	28th	87.1	3rd	524	78.0	44.0
October -	29°968	65.8	—	—	—	60.9	73.2	52.7	29th	80.9	2nd	510	80.0	50.0
November -	29°968	62.7	—	—	—	57.4	69.1	51.3	19th	76.9	25th	442	76.0	49.0
December -	30°133	55.7	—	—	—	49.8	63.7	40.1	1st	68.8	4th	339	75.0	53.0
Mean	30°028	63.3	—	—	—	58.1	72.8	50.84	—	80.3	—	483	79.5	56.5

MALTA.

Lat. 35° 53' 49" N.

January -	29°992	58.8	—	—	—	53.9	62.8	46.4	21st	66.0	24th	370	74.0	43.2
February -	29°913	60.8	—	—	—	54.8	65.4	52.4	17th	70.0	5th	405	65.6	46.8
March -	29°980	53.3	—	—	—	50.2	62.7	46.0	5th	70.0	23rd	368	72.1	47.0
April -	29°854	63.8	—	—	—	56.9	66.5	51.4	7th	76.0	21st	427	71.8	47.7
May -	29°966	65.0	—	—	—	53.2	68.0	52.6	13th	74.0	9th	437	70.0	45.4
June -	29°998	75.8	—	—	—	69.1	80.5	64.2	2nd	87.2	26th	604	68.8	42.0
July -	29°963	78.3	—	—	—	71.3	81.8	65.8	13th	87.4	20th	644	66.1	43.8
August -	29°943	82.2	—	—	—	75.3	86.0	72.2	3rd	90.0	7th	775	71.0	43.0
September -	29°959	80.2	—	—	—	74.3	82.0	61.4	30th	88.6	1st	728	69.4	50.6
October -	30°014	70.7	—	—	—	64.4	73.2	58.6	25th	78.4	6 & 7	604	63.1	49.0
November -	29°989	63.9	—	—	—	58.9	67.4	49.0	19th	79.0	3rd	429	70.9	50.8
December -	30°120	55.7	—	—	—	51.3	59.4	42.4	10th	72.0	5th	310	68.0	44.8
Mean	29°973	67.8	—	—	—	61.5	71.3	55.2	—	78.2	—	500	69.2	46.1

No. VIII.

at Netley and Foreign Stations in the Year 1879.

Long. 1° 20' W. Height of Barometer Cistern above Sea, 47 feet.

Mean Amount of Cloud.	Rainfall.			Weather.								Wind.								
	Total.	Max.	Day.	Number of Days of								Number of Observations under each Point.								
				Rain.	Snow.	Hail.	Thunder Storm.	Fog.	Clear Sky.	Overcast.	Gales.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.
7.0	4.46	1.70	2nd	10	6	—	—	—	1	16	1	1.0	14.0	1.0	6.5	0.5	5.0	1.5	1.5	—
7.5	4.46	0.46	11th	23	5	—	—	1	1.5	18	1	2.0	4.0	0.5	6.0	0.5	9.5	2.0	3.5	—
7.0	0.57	0.15	28th	9	1	—	—	—	2.0	18	—	2.5	5.0	1.0	5.0	0.5	12.0	3.0	2.0	—
7.5	3.18	0.64	6th	15	1	—	1	—	1.0	20	—	2.0	3.5	2.0	2.5	8.0	3.0	8.5	0.5	—
7.0	3.38	0.72	28th	21	1	1	—	1	2.0	16	—	1.5	7.5	—	5.0	0.5	12.0	1.0	3.5	—
8.0	5.46	1.17	30th	22	—	—	1	—	—	18	—	—	—	—	5.0	3.0	19.0	3.0	—	—
7.5	4.32	1.14	19th	19	—	—	—	—	1.0	20	—	1.0	0.5	—	5.0	—	17.5	4.5	2.5	—
6.5	6.19	1.33	19th	17	—	1	5	—	1.0	15	—	0.5	0.5	—	4.5	2.0	21.0	1.5	1.0	—
6.5	4.19	1.06	23rd	15	—	—	—	—	8.5	14.5	1	2.0	4.0	1.0	3.0	1.5	13.5	1.0	4.0	—
6.5	0.95	0.26	24th	13	—	—	—	—	2.0	12.5	—	2.5	9.5	1.5	2.5	0.5	7.5	2.0	5.0	—
6.0	0.42	0.16	20th	5	4	—	—	1	3.0	13.0	—	9.5	5.0	1.5	0.5	1.0	1.5	1.0	10.0	—
7.5	0.72	0.24	31st	6	—	—	1	2	1.5	19.0	—	5.0	11.0	2.0	5.0	0.5	4.5	0.5	2.5	—
7.0	3.19	1.70	1st Jan.	175	18	2	8	5	24.5	200.0	3	29.5	64.5	10.5	50.5	18.5	126.0	29.5	36.0	—

Long. 5° 20' 53" W. Height of Barometer Cistern above Sea, 53 feet.

4.5	3.88	1.08	21st	11	—	—	—	—	13.0	5.0	—	7.5	—	4.0	—	—	—	19.5	—	—
3.7	1.00	1.23	10th	12	—	—	—	—	13.5	2.0	—	0.0	—	—	—	—	—	22.0	—	—
4.1	5.71	1.74	17th	18	—	—	—	—	13.0	2.5	—	3.5	—	13.0	—	—	—	14.5	—	—
3.7	2.27	0.73	13th	11	—	—	—	—	17.5	3.0	—	0.5	—	0.5	—	—	—	29.0	—	—
2.6	0.00	0.00	—	—	—	—	—	—	22.5	2.0	—	0.5	—	15.5	—	—	—	15.0	—	—
1.9	0.00	0.00	—	—	—	—	—	—	26.5	0.5	—	—	—	8.0	—	—	—	22.0	—	—
3.7	0.00	0.00	—	—	—	—	—	—	13.5	1.0	—	—	—	20.0	—	—	—	11.0	—	—
2.8	0.03	0.03	11th	1	—	—	—	—	19.0	0.5	—	—	—	23.5	—	—	—	6.5	—	—
3.2	1.03	0.82	17th	4	—	—	—	—	19.0	3.5	—	4.0	—	11.0	—	1.0	—	14.0	—	—
5.75	5.64	2.45	27th	10	—	—	—	—	8.5	10.5	—	0.5	—	19.5	—	1.0	—	8.0	1.5	0.5
6.7	5.62	2.25	28th	12	—	—	—	—	4.0	14.5	—	0.5	—	18.5	—	—	—	10.0	—	1.0
6.0	6.25	2.84	2nd	20	—	—	—	—	7.5	11.5	—	1.0	—	22.5	—	—	—	7.5	—	—
4.03	31.46	2.45	27th Oct.	97	—	—	—	—	177.5	56.5	—	24.0	—	156.0	—	2.0	—	179.0	1.5	1.5

Long. 14° 30' 54" E. Height of Barometer Cistern above Sea, 70 feet.

4.0	2.53	1.00	19th	11	—	—	—	—	18	2	—	2	2	—	7	—	4	1	15	—
4.0	0.72	0.30	5th	5	—	—	—	—	18	10	—	—	3	3	—	2	10	6	7	—
4.5	4.49	2.60	6th	4	—	1	1	—	10	6	—	—	3	9	—	—	2	4	8	—
3.5	0.08	0.04	24th	2	—	—	—	—	17	2	—	1	1	2	7	—	1	4	13	—
2.5	0.76	0.45	18th	6	—	—	—	—	22	2	—	—	2	3	7	1	6	—	12	—
0.6	0.00	0.00	—	—	—	—	—	—	28	—	2	4	5	4	4	—	1	2	10	—
0.5	0.00	0.00	—	—	—	—	—	—	28.5	0.5	—	—	9	2	1	2	2	2	13	—
0.5	0.00	0.00	—	—	—	—	—	—	30.0	—	—	2	10	1	3	—	—	1	14	—
3.5	9.26	4.83	29th	7	—	—	5	—	16.0	8.0	—	4	5	1	8	2	2	1	7	—
4.5	1.92	1.04	21st	6	—	—	2	—	14.0	6.0	—	—	8	0.5	4.5	—	3	0.5	14.5	—
4.2	4.24	1.63	8th	5	—	—	2	—	14.0	7.0	—	—	7	—	5.0	1	5	1	11	—
4.6	2.51	0.82	12th	16	—	—	3	—	14.0	11.0	—	2	8	—	5.0	1	6	4	7	—
3.00	26.51	4.83	29th Sept.	67	—	1	13	—	229.5	46.5	2.0	18.0	69.0	13.5	57.5	7	42.0	26.5	131.5	—

Annual Abstract of Meteorological Observations taken

MATHIATI, CYPRUS.

Lat. 35° 0' N.

Month.	Mean Pressure.	Air Temperature.										Tension of Vapour.	Relative Humidity.		
		Hourly Means.		Daily Means.		Means of		Abs. Min.		Abs. Max.			Mean.	Minimum.	
		9 a.m.	9 p.m.	Simple.	Reduced.	Min.	Max.	Temp.	Day.	Temp.	Day.				
January	30.044	55.5	—	—	—	43.9	64.1	36.6	2nd	74.8	27th	320	70.5	47.0	27th
February	29.851	58.7	—	—	—	45.0	67.4	37.2	10th	77.0	29th	354	71.0	56.0	29th
March	29.921	68.8	—	—	—	50.7	79.3	42.4	4th	84.8	30th	451	56.5	43.5	16th
April															
May															
June															
July															
August															
September															
October															
November															
December															
Mean	29.932	61.0	—	—	—	46.5	70.2	38.7	—	82.2	—	368	67.0	48.8	—

MOUNT TROADOS, CYPRUS.

Lat. 25° 0' N.

January																
February																
March																
April																
May*	30.114	59.8	—	—	—	46.9	68.2	32.4	15th	77.4	29th	327	62.0	38.0	27th	
June	29.816	69.6	—	—	—	55.9	78.2	44.4	24th	85.0	11th	382	53.0	36.5	29th	
July	29.708	76.4	—	—	—	62.4	83.8	55.0	1st	93.2	25th	434	48.5	32.0	7th	
August	29.667	72.2	—	—	—	58.1	79.9	54.0	16th	85.6	12th	438	55.0	39.0	31st	
September			—	—	—							Observations discontinued.				
October																
November																
December																
Mean	29.826	69.5	—	—	—	55.8	77.5	46.4	—	85.3	—	397	54.8	38.3	—	

* Eighteen days observations only.

POLYMEDIA, CYPRUS.

Lat. 34° 40' N.

January															
February															
March															
April															
May															
June															
July															
August															
September															
October															
November*	29.731	67.6	—	—	—	55.2	74.4	51.0	26th	79.8	9th	403	60.4	51.8	13th
December	29.719	58.1	—	—	—	48.0	65.2	23.4	30th	82.6	2nd	347	74.0	59.4	2nd
Mean	29.725	62.8	—	—	—	51.6	69.8	37.2	—	81.2	—	374	67.2	55.6	—

* Observations commenced from 9th November 1879.—22 days.

No. VIII.—*continued.*

at Netley and Foreign Stations in the year 1879.

Long. 33° 15' E. Height of Barometer Cistern above Sea, 1,150 feet.

Mean Amount of Cloud.	Rainfall.			Weather.								Wind.										Calm.
	Total.	Maximum.	Day.	Number of Days of								Number of Observations under each Point.										
				Rain.	Snow.	Hail.	Thunder Storm.	Fog.	Clear Sky.	Overcast.	Gales.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.			
4.0	2.02	1.18	9th	9	—	1	1	—	15.5	5.5	—	10.0	9.0	2.0	2.5	0.5	0.5	1.0	2.5	—		
4.3	1.32	0.32	10th	9	—	1	2	—	13.5	6.5	2	5.5	1.5	1.5	2.5	3.0	8.0	2.0	7.0	—		
3.1	0.04	0.04	26th	1	—	1	—	—	20.0	4.0	—	4.0	—	0.5	1.5	3.0	3.0	2.0	15.0	—		
3.8	3.98	1.18	9th Feb.	19	—	3	3	—	40.0	14	2	19.5	11.5	4.0	6.5	6.5	11.5	5.0	24.5	—		

Long. 23° 0' E. Height of Barometer Cistern above Sea, 5,600 feet.

3.7	0.72	0.31	16th	3	1	3	2	1	11.5	2	—	—	3.5	1.0	4.0	0.5	6.0	1.5	1.5	—
1.4	1.10	0.36	24th	3	—	—	1	—	25.5	1	—	9.5	0.5	4.0	2.0	3.5	6.5	0.5	3.5	—
0.3	—	—	—	—	—	—	—	—	30.0	0.5	—	8.0	2.5	1.5	0.5	—	2.5	1.5	14.5	—
0.6	0.32	0.20	2nd	2	—	1	1	—	29.5	0.5	—	6.5	2.5	0.5	0.5	—	6.5	1.0	13.5	—
owing to removal of Station.																				
1.5	2.14	0.96	24th June.	8	1	4	4	1	96.5	4	—	24.0	9.0	7.0	7.0	4.0	21.5	4.5	33.0	—

Long. 33° 0' Height of Barometer Cistern above Sea, 300 feet.

2.2	0.73	0.29	14th	3	—	—	3	—	17.0	0.5	—	1.5	—	—	2.0	—	—	4.5	14.0	—
3.9	4.74	1.14	21st	9	2	1	1	—	15.5	5.0	—	5.0	1.0	3.5	0.5	0.5	0.5	5.5	11.5	—
3.0	5.47	1.43	—	12	2	1	4	—	32.5	5.5	—	6.5	1.0	3.5	2.5	0.5	0.5	10.0	28.5	—

Appendix

Annual Abstract of Meteorological Observations taken

SCUTARI.

Lat. 41° N.

Month.	Mean Pressure.	Air Temperature.												Tension of Vapour.	Relative Humidity.		
		Hourly Means.		Daily Means.		Means of		Abs. Min.		Abs. Max.		Mean.	Min.				
		9 a.m.	9 p.m.	Simple.	Reduced.	Min.	Max.	Temp.	Day.	Temp.	Day.		Day.				
January -	30.062	42.9	—	—	—	35.9	50.4	27.3	21st	63.0	5th	232	82.2	47.8	9th		
February -	29.884	46.7	—	—	—	42.9	58.9	33.0	1st	73.2	25th	272	75.0	44.0	26th		
March -	29.932	47.0	—	—	—	39.5	55.2	29.2	15th	68.2	25th	268	83.2	65.0	16th		
April -	29.838	58.9	—	—	—	49.0	70.6	32.3	1st	86.6	6th	375	74.5	55.2	18th		
May -	29.893	66.5	—	—	—	53.1	77.4	44.0	7th	86.2	28th	474	72.5	59.4	14th		
June -	29.884	77.1	—	—	—	59.9	88.3	54.8	6th	93.6	24th	534	57.2	41.6	14th		
July -	29.815	80.9	—	—	—	63.5	93.6	58.4	8th	102.4	6th	533	52.1	40.6	18th		
August -	29.880	79.8	—	—	—	63.0	92.4	59.2	15th	98.2	10th	539	52.4	40.6	12th		
September -	29.942	73.7	—	—	—	60.9	84.9	50.2	26th	92.8	7th	548	64.4	49.4	28th		
October -	29.972	68.1	—	—	—	53.5	70.7	44.0	31st	81.5	2 & 3	439	75.1	58.4	23rd		
November -	29.959	51.6	—	—	—	44.1	59.7	33.2	6th	70.2	3rd	310	79.4	68.6	8th		
December -	30.142	40.6	—	—	—	35.4	47.4	19.0	29th	67.0	1st	216	74.0	50.0	28th		
Mean	29.936	60.9	—	—	—	50.0	70.7	40.3	—	81.9	—	388	70.1	51.7	—		

FORT NAPIER, NATAL.

Lat. 29° 3' S.

January -	29.793	71.7	—	—	—	59.6	82.4	46.3	21st	105.0	29th	520	66.0	26.5	3rd
February -	29.861	70.7	—	—	—	59.6	81.7	54.3	21st	94.7	12th	511	65.5	27.0	10th
March -	29.865	71.6	—	—	—	58.9	84.4	53.7	21st	100.8	14th	508	65.0	39.5	15th
April -	29.961	80.16	—	—	—	54.5	81.3	44.0	21st	94.5	8th	436	72.53	28.0	24th
May -	29.994	61.5	—	—	—	48.3	77.2	39.8	21st	90.0	15th	322	58.00	25.0	26th
June -	29.957	58.5	—	—	—	46.7	72.1	36.8	13th	85.2	7th	296	59.5	40.0	29th
July -	30.007	54.7	—	—	—	44.7	70.5	37.0	5th	85.0	15th	275	63.5	26.0	15th
August -	30.031	62.2	—	—	—	49.3	76.3	40.7	3rd	91.1	17th	310	50.6	25.4	19th
September -	29.962	67.0	—	—	—	54.7	78.9	57.5	21st	93.4	9th	415	63.0	26.5	3rd
October -	29.901	67.1	—	—	—	54.8	76.4	50.5	10th	104.2	31st	416	52.38	23.0	29th
November -	29.769	71.5	—	—	—	58.4	83.3	51.0	10th	104.4	6th	463	57.81	28.0	6th
December -	29.736	71.8	—	—	—	60.0	83.1	51.2	16th	105.3	8th	501	58.48	29.0	8th
Mean	29.903	66.5	—	—	—	54.1	78.0	46.9	—	96.1	—	414	61.02	28.6	—

SIERRA LEONE.

Lat. 8° 29' N.

January -	29.917	81.3	—	—	—	72.1	90.3	65.0	1st	96.0	29th	867	85.0	71.5	6th
February -	29.901	83.6	—	—	—	75.7	92.5	71.0	25th	96.0	15th	931	80.5	72.0	23rd
March -	29.908	83.7	—	—	—	74.8	91.5	70.0	9th	98.0	4th	922	84.5	71.0	20th
April -	29.964	84.0	—	—	—	75.0	91.7	69.0	9th	94.0	9th	932	78.5	72.0	5th
May -	29.917	82.4	—	—	—	74.8	90.4	78.0	2nd	93.0	10th	916	83.5	72.0	29th
June -	29.966	81.9	—	—	—	77.1	90.6	70.0	2nd	95.0	1st	910	84.5	76.0	17th
July -	30.006	78.3	—	—	—	71.1	85.0	69.0	7th	95.0	9th	814	84.0	72.0	9th
August -	30.069	77.0	—	—	—	72.1	82.7	70.0	15 & 16	87.0	2nd	821	88.5	69.5	6th
September -	30.064	79.3	—	—	—	72.5	86.3	71.0	4th	93.0	30th	876	88.0	84.0	4th
October -	29.953	81.7	—	—	—	72.7	89.4	70.0	28th	92.0	27th	929	82.7	68.0	13th
November -	29.938	85.8	—	—	—	72.0	91.0	71.0	8th	93.0	10th	941	81.0	74.0	2nd
December -	29.916	83.8	—	—	—	73.1	90.9	74.0	23rd	89.0	12th	850	82.6	73.0	23rd
Mean	29.861	81.7	—	—	—	73.5	89.3	70.6	—	93.0	—	892	83.6	72.9	—

No. VIII.—continued.

at Netley and Foreign Stations in the Year 1879.

Long. 29° 3' E. Height of Barometer Cistern above Sea, 60 feet.

Mean Amount of Cloud.	Rainfall.			Weather.								Wind.									
	Total.	Max.	Day.	Number of Days of								Number of Observations under each Point.									
				Rain.	Snow.	Hail.	Thunder Storm.	Fog.	Clear Sky.	Overcast.	Gales.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.	
6.7	2.95	0.61	20th	18	—	1	—	—	8	17	—	3.5	11.0	5.5	0.5	4.5	2.5	1.0	1.0	1.5	
7.0	2.22	1.09	18th	10	—	—	—	—	4.5	13.5	—	3.0	2.5	2.5	2.5	8.5	6.0	2.0	0.0	1.0	
7.0	4.33	0.63	25th	20	1	1	—	—	7.0	18.5	—	9.5	5.5	5.5	1.0	2.5	5.5	1.0	0.0	0.5	
5.2	0.81	0.18	4th	10	—	—	1	—	10.5	9.0	—	2.0	1.5	2.0	2.0	8.0	7.5	5.0	0.0	1.5	
4.9	20.50	7.00	1st	10	—	—	—	—	12.5	10.0	—	3.0	6.5	0.5	0.0	5.5	12.0	1.0	0.0	2.5	
1.9	0.00	0.00	—	—	—	—	3	—	25.0	2.5	—	4.0	9.5	4.0	0.0	1.5	11.0	0.00	0.0	0.0	
1.5	0.00	0.00	—	—	—	—	—	—	25.0	0.5	—	6.5	14.5	3.5	0.0	0.0	5.5	0.5	0.0	0.5	
2.6	0.00	0.00	—	—	—	—	—	—	20.0	0.5	—	9.5	12.0	4.0	0.0	0.5	4.0	0.0	0.5	0.5	
4.4	3.29	1.30	25th	11	—	—	—	—	14.0	6.5	—	8.0	11.0	3.0	1.0	0.0	5.5	0.0	1.0	0.5	
5.9	5.08	1.58	9th	16	—	—	1	—	10.5	15.5	—	5.5	9.5	3.0	1.0	2.5	7.5	0.5	0.5	1.0	
6.8	6.37	2.05	4th	18	—	1	—	—	6.0	15.5	—	3.0	9.0	4.0	1.5	3.0	6.0	1.5	0.0	1.5	
7.9	4.64	0.79	7th	24	7	3	2	—	3.5	20.5	1	7.0	12.0	1.0	1.0	1.5	5.5	—	2.5	0.5	
5.1	50.19	7.00	1st May	137	10	8	12	—	147.5	129.5	1	64.5	104.5	38.5	10.5	38.0	78.5	12.5	5.5	11.5	

Long. 30° 2' E. Height of Barometer Cistern above Sea, 2,200 feet.

7.1	5.15	1.60	7th	18	—	—	11	—	6.5	18.5	1	1.0	12.5	9.0	5.5	1.5	—	0.5	1.00	—
7.2	6.71	2.50	6th	12	—	—	6	—	7.0	16.0	—	0.5	4.5	17.0	4.0	—	0.5	—	1.00	0.5
5.7	5.08	1.44	17th	14	—	—	4	—	11.5	12.0	—	1.0	6.0	16.0	3.0	1.5	0.5	0.5	1.5	1.0
3.5	0.88	0.50	4th	5	—	—	—	—	16.0	8.5	—	0.5	3.5	19.0	4.5	0.5	—	—	2.0	—
4.1	0.37	0.30	30th	2	—	—	—	—	18.5	9.5	—	1.5	3.5	22.5	2.0	0.5	—	1.0	—	—
4.3	0.82	0.51	21st	7	—	—	2	—	13.5	10.0	—	—	3.5	17.0	4.0	1.5	0.5	0.5	3.0	—
3.4	0.53	0.27	7th	4	—	—	1	—	17.0	6.5	1	1.5	1.5	16.0	5.0	0.5	1.0	3.0	2.5	—
3.5	1.87	0.55	25th	4	—	—	1	—	18.5	8.5	—	1.5	10.0	13.0	2.0	1.0	1.5	—	2.0	—
5.4	2.42	0.67	26th	8	—	—	3	—	15.5	—	—	2.0	12.0	11.0	2.0	1.0	—	1.0	1.0	—
6.7	2.41	1.58	12th	12	—	—	5	—	8.5	20.5	—	1.5	12.5	10.0	3.5	—	1.5	0.5	1.0	0.5
5.7	4.35	1.68	24th	16	—	—	8	—	11.5	15.0	—	2.0	9.5	8.5	3.0	—	1.0	2.0	4.0	—
6.8	3.78	1.08	20th	20	—	—	9	—	8.5	19.5	—	2.5	19.5	5.0	1.0	—	0.5	1.0	1.5	—
5.2	34.17	2.50	6th Feb.	122	—	—	50	—	153.5	144.5	2	15.5	98.5	164.0	39.5	8.0	7.0	10.0	20.5	2.0

Long. 13° 9' W. Height of Barometer Cistern above Sea, 224 feet.

3.4	0.02	0.02	22nd	1	—	—	—	—	19	—	—	1.5	—	20.5	—	—	—	3.5	1.0	4.5
3.3	—	—	—	—	—	—	2	—	21	—	—	3.0	1.0	8.0	—	4	4	10.0	1.0	—
3.3	1.51	0.94	15th	6	—	—	5	—	20	—	—	2.0	1.0	1.0	—	6	4	11.0	1.5	4.5
3.1	8.77	2.53	30th	11	—	—	3	—	23	—	—	1.0	—	7.0	—	2	5	12.0	2.0	1.0
3.3	23.20	4.25	21st	16	—	—	12	—	21	—	—	1.5	3.0	8.0	1.0	—	5	11.0	1.0	0.5
3.5	10.80	2.35	28th	21	—	—	12	—	17	—	—	1.0	1.0	8.0	—	2	7	4.0	1.0	6.0
4.0	49.13	4.85	25th	29	—	—	4	—	7	—	—	—	1.0	3.5	1.0	2	4.5	8.5	—	10.5
3.9	56.14	7.23	4th	28	—	—	3	—	6	—	—	9	1.0	1.0	1.0	2	8	4.0	—	4.0
3.4	30.98	4.33	15th	26	—	—	2	—	19	—	—	—	—	0.0	1.0	—	1	22.0	3	4.0
3.0	17.15	3.37	15th	20	—	—	10	—	29	—	—	1.0	—	7.0	—	—	1	16.0	—	4.0
3.0	1.55	0.53	5th	6	—	—	13	—	30	—	—	—	—	11.0	—	—	—	16.0	—	3.0
3.0	0.92	0.90	13th	2	—	—	3	—	—	—	—	2.0	0.50	10.5	1.5	—	—	13.5	2	1.0
3.3	20.17	7.23	4th Aug.	166	—	—	69	—	212	—	—	22	8.5	85.5	5.5	18	39.5	181.5	12.5	43.0

Annual Abstract of Meteorological Observations taken

BARBADOES.

Lat. 13° 4' 30" N.

Month.	Mean Pressure.	Air Temperature.										Tension of Vapour.	Relative Humidity.		
		Hourly Means.		Daily Means.		Means of		Abs. Min.		Abs. Max.			Mean.	Min.	
		9 a.m.	9 p.m.	Simple.	Reduced.	Min.	Max.	Temp.	Day.	Temp.	Day.				
January -	30°015	80.5	—	—	—	74.5	85.6	72.0	12th	87.5	8th	733	71.5	60.5	1st
February -	30°000	81.0	—	—	—	75.0	85.4	72.5	9th	87.0	5th	822	70.5	68.0	25th
March -	29°988	82.0	—	—	—	74.4	85.9	70.0	7th	89.0	17th	824	70.0	67.5	21st
April -	30°005	84.6	—	—	—	76.7	88.2	74.5	5th	91.0	22nd	772	64.0	60.0	9th
May -	29°966	84.7	—	—	—	76.8	88.1	73.5	6th	89.5	5th	787	68.0	58.0	8th
June -	30°022	83.7	—	—	—	76.8	87.5	74.0	10th	92.0	8th	820	73.3	61.0	18th
July -	30°008	83.3	—	—	—	74.9	87.5	72.0	13th	89.5	27th	800	72.0	68.0	22nd
August -	29°973	83.9	—	—	—	76.6	87.8	72.0	14th	91.0	9th	841	72.0	68.0	22nd
September -	30°001	84.2	—	—	—	77.4	87.8	75.0	24&25	89.5	17th	837	72.0	68.0	7th
October -	29°962	83.4	—	—	—	76.4	87.3	73.0	7th	89.0	1st	820	71.6	69.2	21st
November -	29°938	82.9	—	—	—	76.7	86.4	73.0	29th	89.5	1st	785	69.6	63.0	29th
December -	30°080	81.1	—	—	—	73.9	86.6	71.0	5th	86.5	3rd	722	68.0	57.0	14th
Mean	30°002	82.9	—	—	—	75.8	87.0	72.7	—	89.2	—	797	71.2	62.1	—

NEWCASTLE, JAMAICA.

Lat. 18° 62' N.

January -	30°058	67.5	—	—	—	56.0	75.5	47.0	20th	79.0	2nd	511	78.0	53.0	4th
February -	30°039	66.2	—	—	—	55.7	76.8	53.0	21st	80.0	15th	492	78.5	58.0	6th
March -	30°060	66.1	—	—	—	55.1	76.2	53.0	4th	80.0	14th	466	75.0	61.0	19th
April -	30°038	69.4	—	—	—	56.7	77.7	50.0	26th	85.2	1st	545	83.5	61.5	8th
May -	30°001	71.1	—	—	—	56.5	78.6	52.0	15th	85.0	10th	587	76.5	58.5	14th
June -	30°012	71.2	—	—	—	59.2	75.90	56.0	5th	81.0	10th	603	78.0	62.5	29th
July -	30°061	73.3	—	—	—	59.1	78.6	57.0	14th	83.0	8th	588	74.5	66.0	2nd
August -	30°039	72.4	—	—	—	59.8	77.3	57.0	27th	80.0	31st	614	79.0	62.0	26th
September -	29°952	72.6	—	—	—	59.2	77.4	56.0	13th	80.0	6th	605	84.3	59.4	14th
October -	29°939	70.1	—	—	—	57.66	75.46	52.0	10th	80.0	28th	573	68.8	58.8	18th
November -	30°050	70.7	—	—	—	54.9	72.20	47.0	23rd	81.0	2nd	549	61.6	57.7	13&14
December -	30°142	68.5	—	—	—	50.1	68.70	45.0	1 & 6	76.0	18&20	469	57.8	51.1	5&17
Mean	30°032	68.2	—	—	—	56.66	74.4	52.0	—	80.7	—	552	72.9	59.1	—

UP-PARK CAMP, JAMAICA.

Lat. 17° 59' N.

January -	29°880	83.9	—	—	—	64.9	96.5	60.0	6th	99.0	24th	775	65.0	52.0	30th
February -	29°880	84.3	—	—	—	68.0	96.8	62.0	14th	98.0	1st	809	68.5	55.0	18th
March -	29°883	83.7	—	—	—	64.8	96.0	61.0	6th	99.0	24th	773	64.5	52.0	30th
April -	29°870	84.0	—	—	—	65.4	96.4	60.0	6th	99.0	22nd	789	68.0	52.0	27th
May -	29°873	83.7	—	—	—	64.5	96.6	61.0	21st	99.0	6th	790	68.5	55.0	12th
June -	29°898	84.0	—	—	—	67.5	96.4	62.0	24th	99.0	20th	806	68.0	55.0	14th
July -	29°916	86.0	—	—	—	69.4	97.0	64.0	10th	100.0	12th	771	61.0	49.5	21st
August -	29°902	84.7	—	—	—	69.0	97.0	63.0	13th	99.0	8th	819	68.5	52.0	6th
September -	29°902	84.8	—	—	—	66.5	96.8	63.0	2nd	99.0	13th	772	66.4	55.0	14&22
October -	29°874	83.3	—	—	—	67.2	94.2	60.0	16th	98.0	19th	829	72.0	67.0	10th
November -	29°879	85.6	—	—	—	66.5	97.0	62.0	2nd	99.0	14th	837	67.8	55.0	2nd
December -	29°905	84.9	—	—	—	66.0	97.4	62.0	3rd	99.0	9th	808	71.6	61.0	4th
Mean	29°888	84.4	—	—	—	66.6	96.5	61.6	—	98.9	—	803	75.3	55.0	—

No. VIII.—continued.

at Netley and Foreign Stations in the Year 1879.

Long. 59° 40' 30" W. Height of Barometer Cistern above Sea, 30 feet.

Mean Amount of Cloud.	Rainfall.			Weather.								Wind.								
	Total.	Max.	Day.	Number of Days of								Number of Observations under each Point.								
				Rain.	Snow.	Hail.	Thunder Storm.	Fog.	Clear Sky.	Overcast.	Gales.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.
2.2	2.01	0.75	8th	21	—	—	—	—	29.0	1.0	—	—	29.0	1.0	1.0	—	—	—	—	—
3.0	2.51	0.75	13th	13	—	—	—	—	25.5	2.5	—	—	22.0	6.0	—	—	—	—	—	—
3.1	2.17	0.75	22nd	12	—	—	—	—	27.5	3.5	—	1	25.0	5.0	—	—	—	—	—	—
2.8	0.54	0.15	30th	8	—	—	—	—	28.0	0.5	—	—	25.0	4.0	1.0	—	—	—	—	—
3.8	2.02	0.75	19th	10	—	—	—	—	23.5	—	—	—	15.0	—	15.0	—	—	—	—	—
4.3	8.38	1.69	9th	21	—	—	—	—	19.0	5.0	—	—	28.0	1.0	6.0	—	—	—	—	—
3.7	4.35	1.14	16th	21	—	—	—	—	25.0	2.5	—	0.5	25.5	2.0	3.0	—	—	—	—	—
4.1	14.24	9.57	13th	13	—	—	—	—	22.0	5.0	—	—	21.0	2.0	6.0	—	1.0	—	1.0	—
3.8	2.67	0.72	9th	13	—	—	—	—	22.5	4.5	—	—	2.0	2.5	4.5	—	—	—	—	—
3.9	4.91	0.75	4 & 22	17	—	—	—	—	21.5	6.5	—	0.5	18.0	3.5	9.0	—	—	—	—	—
4.2	15.47	6.53	15th	19	—	—	—	—	20.0	3.5	—	1.5	24.5	2.5	1.0	—	—	—	0.5	—
3.0	2.40	0.38	24th	18	—	—	—	—	27.0	0.5	—	1.0	28.0	0.5	1.5	—	—	—	—	—
3.5	62.47	6.56	15th Nov.	186	—	—	—	—	290.5	35.0	—	4.5	258.0	30.0	48.0	—	1.0	—	1.5	—

Long. 76° 42' W. Height of Barometer Cistern above Sea, 3,800 feet.

3.5	3.51	1.20	27th	6	—	—	—	—	13.0	0.5	—	1.5	2.0	13.5	12.0	—	—	—	—	2.0
4.3	6.14	1.10	13th	18	—	—	—	—	12.5	4.0	—	0.5	1.0	8.0	10.0	2.5	—	1.0	—	5.0
4.5	18.62	3.60	10th	9	—	—	—	—	16.0	6.0	—	1.5	1.5	7.0	10.5	2.5	—	0.5	—	7.5
5.1	28.85	8.08	22nd	17	—	—	—	—	9.0	6.0	—	0.5	0.5	8.5	12.5	1.0	0.5	2.0	—	4.5
5.5	13.51	1.48	11th	19	—	—	—	1	8.5	11.0	—	—	—	16.0	7.0	1.0	—	—	—	7.0
5.5	18.96	2.44	3rd	24	—	—	4	—	6.5	6.5	—	—	2.5	10.5	8.0	2.0	—	1.0	—	6.0
4.5	6.66	2.44	18th	9	—	—	3	—	13.5	5.5	—	—	0.5	13.5	7.5	0.5	0.5	1.0	—	7.5
5.2	15.49	2.48	11th	21	—	—	4	—	10.5	12.0	—	—	—	10.0	12.5	0.5	1.5	2.0	—	4.5
4.8	17.05	4.42	8th	20	—	—	2	—	12.0	6.0	—	—	—	16.0	9.0	—	—	0.5	—	4.5
6.1	36.19	8.80	11th	18	—	—	4	—	8.0	10.5	—	—	—	14.5	9.0	1.0	—	—	—	6.5
4.4	14.10	4.00	23rd	21	—	—	—	—	9.5	4.5	3	—	1.0	16.5	8.5	—	1.0	1.5	—	1.5
4.5	1.01	0.30	31st	7	—	—	—	—	11.0	7.5	—	—	1.0	10.0	12.5	0.5	0.5	—	—	6.5
4.8	180.09	8.80	11th Oct.	187	—	—	17	1	132.0	80.0	3	4	10.0	144.0	119.0	11.5	4.0	9.0	—	63.0

Long. 76° 56' W. Height of Barometer Cistern above Sea, 235 feet.

4.5	0.37	0.19	5th	2	—	—	—	—	15.5	1.0	—	2.0	28.0	—	0.5	—	—	—	—	0.5
4.0	1.95	1.08	23rd	5	—	—	—	—	8.0	—	—	—	26.5	—	1.5	—	—	—	—	—
4.5	0.85	0.19	22nd	5	—	—	—	—	8.0	1.5	—	2.0	26.5	0.5	1.5	—	—	—	—	0.5
4.0	4.53	1.78	27th	10	—	—	—	—	11.0	4.0	—	—	19.5	—	9.5	—	—	—	—	1.0
5.5	3.66	1.15	28th	7	—	—	9	—	2.0	3.5	—	—	19.5	—	11.0	—	1	—	—	0.5
6.0	6.63	1.43	16th	13	—	—	20	—	0.5	7.5	—	—	20.5	—	9.5	—	—	—	—	—
4.5	0.43	0.15	19th	4	—	—	23	—	8.5	—	—	—	13.0	—	15.5	—	0.5	—	—	2.0
5.0	13.27	3.28	26th	10	—	—	24	—	5.0	4.5	—	—	17.5	—	13.0	—	—	—	—	0.5
5.0	5.66	2.28	9th	12	—	—	—	—	8.0	2.0	—	—	27.0	—	2.5	—	—	—	—	0.5
6.0	40.12	6.39	13th	29	—	—	—	—	3.5	18.5	—	0.5	10.0	6.5	11.0	—	—	0.5	1.00	1.5
3.5	1.46	0.72	3rd	4	—	—	—	—	10.5	—	—	5.0	4.5	0.5	20.0	—	—	—	—	—
5.5	0.60	0.31	10th	4	—	—	—	—	15.5	—	—	—	8.0	11.0	11.5	0.5	—	—	—	—
6	79.43	6.39	13th Oct.	105	—	—	76	—	96.0	42.5	—	0.5	219.5	18.5	107.0	0.5	1.5	0.5	1.00	7.00

Annual Abstract of Meteorological Observations taken

NASSAU, BAHAMAS.

Lat. 25° 5' N.

Month.	Mean Pressure.	Air Temperature.										Tension of Vapour.	Relative Humidity.		
		Hourly Means.		Daily Mean.		Means of		Abs. Min.		Abs. Max.			Mean.	Min.	
		9 a.m.	9 p.m.	Simple.	Reduced.	Min.	Max.	Temp.	Day.	Temp.	Day.			Day.	
January -	30.156	71.3	—	—	—	64.8	77.6	58.5	21st	85.0	16th	609	78.5	55.9	22nd
February -	30.073	71.9	—	—	—	64.5	78.1	57.5	2nd	85.0	8th	577	72.5	51.1	24th
March -	30.125	74.2	—	—	—	65.7	79.9	57.5	31st	85.0	23rd	589	68.4	51.6	3rd
April -	30.042	76.7	—	—	—	67.6	82.9	59.5	4th	88.0	13th	647	69.7	52.1	1st
May -	29.987	79.5	—	—	—	68.0	84.9	64.5	1st	89.5	17th	717	69.8	54.4	5th
June -	30.014	81.0	—	—	—	73.1	86.3	69.8	2nd	90.5	16th	773	71.2	58.5	3rd
July -	30.058	84.4	—	—	—	74.2	90.4	70.0	3rd	95.0	14th	886	69.6	58.0	16th
August -	29.972	84.8	—	—	—	75.9	90.5	70.2	31st	94.2	10th	848	70.0	51.5	27th
September -	30.000	83.5	—	—	—	74.4	89.3	69.5	28th	93.2	20th	798	73.2	43.0	11th
October -	29.976	81.3	—	—	—	74.3	85.2	71.0	2nd	88.5	10th	793	73.6	55.5	10th
November -	30.069	76.4	—	—	—	70.4	80.7	61.2	21st	85.8	19th	623	67.8	51.0	22nd
December -	30.125	74.7	—	—	—	67.5	79.9	62.5	6th	84.2	12th	663	76.9	57.4	4th
Mean	30.004	78.2	—	—	—	70.1	83.8	64.3	—	88.6	—	705	70.6	53.3	—

BERMUDA.

Lat. 32° 17' 45" N.

January -	30.092	60.7	—	—	—	53.9	65.7	44.0	4th	73.3	2nd	391	71.0	57.0	8th
February -	30.035	61.2	—	—	—	56.1	66.7	43.8	22nd	73.9	17th	425	72.0	57.0	22nd
March -	30.115	63.3	—	—	—	57.7	68.4	50.8	7th	74.6	24th	443	72.0	55.0	21st
April -	30.056	64.5	—	—	—	57.9	70.1	46.8	25th	75.7	16th	427	67.0	50.0	1st
May -	30.098	70.6	—	—	—	64.4	75.6	57.0	5th	80.9	23rd	560	73.0	51.0	21st
June -	30.122	76.4	—	—	—	68.3	82.0	59.0	9th	86.5	29th	686	75.0	57.0	9th
July -	30.122	79.8	—	—	—	72.1	86.7	67.0	3rd	94.5	29th	794	80.0	53.0	3rd
August -	30.106	85.0	—	—	—	74.5	90.8	69.5	21st	94.6	18th	850	68.5	62.0	20th
September -	30.110	80.2	—	—	—	73.3	86.7	69.0	7th	91.1	22nd	792	71.0	50.0	2nd
October -	30.104	75.6	—	—	—	68.1	79.8	58.0	26th	86.9	24th	631	70.0	56.0	10th
November -	30.166	69.8	—	—	—	63.5	73.2	60.5	23rd	78.0	19th	582	78.0	56.0	6th
December -	30.247	68.1	—	—	—	61.5	72.9	59.5	1st	78.9	14th	577	83.0	67.0	23th
Mean -	30.114	71.2	—	—	—	64.2	76.5	56.3	—	82.4	—	598	73.7	55.9	—

SINGAPORE.

Lat. 1° 16' N.

January -	29.220	80.7	—	—	—	67.3	88.9	66.0	22nd	94.8	20th	897	85.5	78.5	24th
February -	29.312	79.2	—	—	—	68.0	90.8	67.0	19th	94.8	25th	908	79.0	67.0	19th
March -	29.311	83.8	—	—	—	68.6	91.1	67.0	4th	94.8	1st	933	80.6	67.0	4th
April -	29.327	83.2	—	—	—	72.2	93.5	66.8	14th	94.8	16th	931	81.8	66.8	14th
May -	29.304	84.2	—	—	—	70.3	92.6	68.6	5th	94.0	1st	901	82.6	68.6	5th
June -	29.294	83.7	—	—	—	69.7	91.4	72.0	2nd	94.8	1st	908	84.0	72.0	2nd
July -	29.286	83.4	—	—	—	69.5	92.2	67.2	22nd	96.8	8th	889	85.2	67.2	22nd
August -	29.287	81.5	—	—	—	68.5	90.1	66.2	1 & 11	93.6	6th	880	82.4	66.2	1st
September -	29.296	80.0	—	—	—	69.5	94.1	65.4	21st	93.6	17th	897	81.4	65.4	21st
October -	29.294	82.2	—	—	—	68.9	90.3	67.2	26th	94.0	11th	907	82.6	67.2	26th
November -	29.284	83.2	—	—	—	69.1	90.3	67.0	1st	94.8	8th	910	82.4	67.0	1st
December -	29.282	83.6	—	—	—	68.9	90.6	68.0	12th	94.8	12th	875	84.8	68.0	13th
Mean -	29.291	82.3	—	—	—	70.8	91.3	67.3	—	94.6	—	910	82.6	68.4	—

No. VIII.—continued.

at Netley and Foreign Stations in the Year 1879.

Long. 77° 21' W. Height of Barometer Cistern above Sea, 44 feet.

Mean Amount of Cloud.	Rainfall.		Weather.									Winds.										
	Total.	Max.	Day.	Number of Days of									Number of Observations under each Point.									
				Rain.	Snow.	Hail.	Thunder Storm.	Fog.	Clear Sky.	Overcast.	Gales.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.		
5.5	0.92	0.41	23rd	6	—	—	—	—	—	5.5	8	—	1.0	11.0	3.0	10.0	0.5	2.0	—	—	3.5	—
5.7	1.29	0.05	11th	8	—	—	—	—	—	4.0	6	—	1.0	12.0	2.0	7.0	1.5	1.5	—	—	3.5	—
5.6	2.84	2.45	14th	6	—	—	—	1	—	6.0	6	—	1.0	14.0	3.0	6.5	1.0	1.5	—	—	4.0	—
5.5	0.42	0.13	17th	4	—	—	—	—	—	3.0	7.5	—	1.5	11.0	1.5	7.0	2.5	3.0	—	—	3.5	—
7.0	8.85	0.90	9th	13	—	—	—	1	—	1.0	13.0	—	1.5	18.0	1.5	4.0	2.0	2.0	—	—	2.0	—
7.1	12.77	5.37	26th	14	—	—	—	3	—	1.5	16.5	—	0.5	11.0	3.0	12.5	2.0	0.5	—	—	0.5	—
6.2	7.43	1.80	30th	18	—	—	—	2	—	1.0	10.5	—	—	9.5	5.0	10.0	1.0	3.5	0.5	—	1.5	—
7.0	9.85	3.11	16th	13	—	—	—	—	—	1.5	14.5	—	2.0	10.0	3.5	12.0	2.0	1.5	—	—	—	—
6.6	8.02	2.27	12th	20	—	—	—	3	—	3	14.5	—	0.5	7.5	4.5	14.5	1.5	1.5	—	—	—	—
6.6	6.5	1.60	25th	19	—	—	—	—	—	3	14.5	—	1.5	13.5	9.5	4.0	0.5	1.0	—	—	1.0	—
5.5	7.98	7.41	7th	6	—	—	—	—	—	9.5	5.5	0.5	4.0	20.0	2.5	0.5	0.5	—	—	—	2.5	—
4.4	1.6	0.95	1st	11	—	—	—	—	—	9.5	5	—	2.0	15.5	6.0	6.0	0.5	0.5	—	—	0.5	—
6.0	63.47	7.41	7th Nov.	138	—	—	—	10	—	48.5	121.5	0.5	16.5	153.0	46.0	94.0	15.5	18.5	0.5	—	22.5	—

Long. 64° 47' W. Height of Barometer Cistern above Sea, 151 feet.

6.8	5.25	1.71	6th	20	—	1	—	—	6	16	—	6	2	—	—	—	6	10	3	4	—
7.3	7.42	1.72	28th	22	—	1	—	—	2	16	—	1	3	3	2	2	9	7	1	—	—
6.1	4.04	0.73	12th	16	—	—	3	—	7	12	—	7	4	3	2	3	7	3	2	—	—
5.8	4.50	0.83	8th	14	—	—	1	—	8	10	—	9	1	1	2	1	12	2	2	—	—
5.9	4.50	2.58	21st	9	—	—	—	—	8	9	—	3	1	3	13	4	3	2	2	—	—
6.2	4.64	1.18	22nd	14	—	—	1	—	5	10	—	2	5	1	6	2	11	2	1	—	—
6.0	8.17	2.40	19th	10	—	—	1	—	5	11	—	1	2.5	1.5	4.5	1	15	3	2	0.5	—
6.0	4.06	1.42	29th	3	—	—	1	—	6	12	—	1	0.5	0.0	4.5	1	18.5	1.5	1.0	3.0	—
6.3	4.00	0.80	8th	12	—	—	1	—	6	13	—	1.5	5.0	1.0	8.0	1.5	9.5	1.0	2.5	0.0	—
5.8	2.68	0.79	28th	3	—	—	—	—	16	12	8	3.0	15.0	1.5	4.0	1.0	1.5	0.0	4.5	0.5	—
6.5	3.46	1.09	20th	5	—	—	—	—	5	15	—	1.5	12.0	0.5	1.5	1.0	2.5	1.5	6.0	3.5	—
7.1	3.33	1.80	6th	4	—	—	—	—	2	21	—	1.0	6.0	1.5	4.0	0.5	11.0	1.0	2.5	3.5	—
6.3	56.25	2.68	21st May	132	—	2	8	—	76	157	8	37.0	57.0	17.0	51.5	18.0	106.0	34.0	29.5	15.0	—

Long. 105° 31' E. Height of Barometer Cistern above Sea, 116 feet.

4.5	17.79	3.25	21st	26	—	—	—	—	3	3	—	—	31	—	—	—	—	—	—	—	—
4.0	8.23	4.32	19th	16	—	—	—	—	7	2.5	—	—	28	—	—	—	—	—	—	—	—
4.0	10.30	1.80	30th	17	—	—	—	—	12	1.5	—	—	28	—	—	—	—	—	—	—	—
4.0	6.28	1.48	25th	17	—	—	—	—	13	2.5	—	—	—	—	—	—	—	—	—	—	—
4.9	11.23	2.83	22nd	18	—	—	—	—	10	3.0	—	—	—	—	—	—	—	—	—	—	—
3.5	7.76	2.40	15th	12	—	—	—	—	8.5	1.0	—	—	—	—	—	—	—	—	—	—	—
3.5	4.04	1.13	18th	13	—	—	—	—	11.5	—	—	—	—	—	—	—	—	—	—	—	—
5.0	7.65	1.46	30th	20	—	—	—	—	9.0	22	—	—	—	—	—	—	—	—	—	—	—
3.5	4.58	0.88	10th	11	—	—	—	—	15.0	15	—	—	—	—	—	—	—	—	—	—	—
4.0	13.15	2.32	29th	23	—	—	—	—	11.0	20	—	—	31	—	—	—	—	—	—	—	—
4.0	8.78	1.64	17th	20	—	—	—	—	10.0	20	—	—	30	—	—	—	—	—	—	—	—
8.5	10.29	1.50	13th	17	—	—	—	—	16.0	15	—	—	31	—	—	—	—	—	—	—	—
3.9	110.08	4.32	19th Feb.	210	—	—	38	—	116	105.5	—	—	170	—	—	—	186	—	—	—	—

Appendix

Annual Abstract of Meteorological Observations taken

HONG KONG, CHINA.

Lat. 22° 16' N.

Month.	Mean Pressure.	Air Temperature.										Tension of Vapour.	Relative Humidity.		
		Hourly Means.		Daily Means.		Means of.		Abs. Min.		Abs. Max.			Minimum.		
		9 a.m.	9 p.m.	Simple.	Reduced.	Min.	Max.	Temp.	Day.	Temp.	Day.				
January .	30.148	60.1	—	—	—	61.1	65.8	43.0	1st	74.2	22nd	388	76.0	52.5	4th
February .	30.071	61.8	—	—	—	56.8	69.2	49.6	10th	80.1	18th	419	78.0	53.0	19th
March .	30.094	62.4	—	—	—	57.9	68.8	46.2	6th	84.3	31st	450	77.0	50.0	27th
April .	29.958	70.7	—	—	—	67.9	77.8	60.0	12th	88.0	24th	629	78.0	52.5	11th
May .	29.826	82.7	—	—	—	76.8	88.6	72.3	12th	95.6	23rd	861	76.5	56.0	28th
June .	29.705	82.7	—	—	—	77.3	88.0	69.2	3rd	93.2	2nd	879	76.0	52.5	4th
July .	29.753	83.2	—	—	—	77.8	90.2	73.5	29th	95.6	17th	904	80.5	68.5	17th
August .	29.737	83.3	—	—	—	78.0	90.9	75.3	6th	96.0	25th	883	77.2	62.0	24th
September .	29.805	82.2	—	—	—	77.1	88.0	74.7	9th	94.3	6th	840	76.0	64.0	23rd
October .	29.994	79.2	—	—	—	74.7	84.1	69.8	20th	92.4	1st	725	71.8	60.0	8th
November .	30.002	70.1	—	—	—	65.6	75.0	54.3	11th	83.8	20th	538	67.0	56.6	10th
December .	30.082	61.4	—	—	—	58.5	79.7	49.3	31st	77.0	4th	421	66.6	45.8	11th
Mean .	29.938	73.5	—	—	—	69.1	80.5	61.4	—	87.8	—	662	75.0	55.6	—

Summary of Results of Meteorological Observations taken

Stations, with their Height above the sea.	Mean Pressure.	Air Temperature.								Tension of Vapour.	Relative Humidity.		Mean amount of Cloud.	
		Hourly Means.	Means of		Abs. Min.		Abs. Max.		Mean.		Min.			
			9 a.m.	Min.	Max.	Temp.	Day.	Temp.				Day.		
Mediterranean:	ft.													
Gibraltar - - 53	30.028	63.3	58.1	72.8	50.8	27 Feb.	80.3	13 July	.483	79.5	56.5	18 Aug. 4.03		
Malta - - - 70	29.973	67.8	61.5	71.3	55.2	10 Dec.	78.2	7 Aug.	.500	69.2	46.1	9 Sept. 3.00		
Scutari - - - 60	29.936	60.9	50.0	70.7	40.3	29 Dec.	81.9	6 July	.388	70.1	51.7	24 June 5.10		
Cyprus:														
Mathiati* - 1,150	29.932	61.0	46.5	70.2	38.7	2 Feb.	82.2	30 April	.368	67.0	48.8	16 April 3.8		
Mount Troadost - 5,600	29.826	69.5	55.8	77.5	46.4	15 May	85.3	25 July	.397	54.8	38.3	7 July 1.5		
Polymedia† - 300	29.725	62.8	51.6	69.8	37.2	30 Dec.	81.2	2 Dec.	.374	67.2	55.6	15 Nov. 3.0		
African:														
Fort Napier, Natal - 2,200	29.903	66.5	54.1	78.9	46.9	13 June	96.1	8 Dec.	.411	61.02	28.6	29 Oct. 5.2		
Sierra Leone - - 224	29.861	81.7	73.5	89.3	70.6	1 Jan.	93.4	4 Mar.	.392	83.6	72.9	13 Oct. 3.3		
American & West Indian:														
Barbadoes - - 30	30.002	82.9	75.8	87.0	72.7	7 Mar.	89.2	8 June	.797	71.2	62.1	14 Dec. 3.5		
Nassau, Bahamas - 44	30.004	78.2	70.1	83.8	64.3	2 Feb.	88.6	14 July	.705	70.6	53.3	11 Sept. 6.0		
Newcastle, Jamaica - 3,800	30.032	68.2	56.66	74.4	52.0	1 Dec.	80.7	1 April	.552	72.9	50.1	5 Dec. 4.8		
Up-Park Camp „ - 235	29.888	84.4	74.9	96.5	61.6	6 Jan.	98.9	12 July	.803	75.3	55.0	17 Dec. 4.6		
Bermuda - - 151	30.114	71.2	64.2	76.5	56.3	22 Feb.	82.4	18 Aug.	.598	73.7	55.9	1 April 6.3		
Singapore‡ - - 116	29.291	82.3	70.8	91.3	67.3	22 Jan.	94.6	8 July	.910	82.6	68.4	2 Sept. 3.9		
Hong Kong - - 43	29.938	73.5	69.1	80.5	61.4	1 Jan.	87.8	25 Aug.	.662	75.0	55.6	27 Mar. 8.2		

* Observations for 3 months only, February, March, and April.

† Observations from 14th May to 31st August, discontinued owing to removal of station.

No. VIII.—continued.

at Netley and Foreign Stations in the Year 1879.

Long. 114° 9' E. Height of Barometer Cistern above Sea, 43 feet.

Mean Amount of Cloud.	Rainfall.			Weather.								Wind.								
	Total.	Max.	Day.	Number of Days of								Number of Observations under each Point.								
				Rain.	Snow.	Hail.	Thunder-storm.	Fog.	Clear Sky.	Overcast.	Gales.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.
6.3	0.73	0.38	14th	6	—	—	—	—	10.5	17.0	—	3.0	—	15.0	—	—	—	2.0	—	11.0
5.0	2.10	1.53	26th	4	—	—	3	—	12.0	10.5	—	3.0	—	16.5	—	—	—	2.5	—	6.0
2.5	4.61	1.77	1st	10	—	—	—	—	8.5	18.0	—	4.0	13.0	5.5	0.5	0.5	0.5	1.0	0.5	5.5
7.3	5.89	2.07	18th	8	—	—	—	—	6.5	19.5	—	2.0	9.5	4.5	1.0	0.5	4.5	2.0	0.5	5.5
7.2	5.39	2.28	11th	10	—	—	—	—	2.0	13.0	—	—	3.5	3.0	1.5	4.5	3.0	7.5	1.0	7.0
6.5	12.26	2.82	23rd	16	—	—	—	—	3.0	18.5	—	—	5.5	6.5	4.0	3.0	3.5	2.0	—	6.5
7.9	18.43	2.73	3rd	21	—	—	—	—	5.0	13.5	—	—	2.5	2.5	—	4.5	2.5	5.5	—	12.5
6.2	16.43	4.23	5th	15	—	—	—	—	7.0	13.0	—	—	3.5	4.5	3.0	4.0	2.0	5.5	0.5	8.0
7.2	19.25	0.45	14th	15	—	—	—	—	5.0	17.0	—	1.0	16.0	—	1.5	1.0	4.0	2.5	1.0	—
5.0	4.53	1.30	12th	11	—	—	—	—	13.5	12.5	1	4.5	13.0	9.5	0.5	—	—	0.5	—	3.0
5.8	1.86	0.70	21st	6	—	—	—	—	12.0	13.0	—	1.5	15.5	2.5	1.5	—	—	2.5	2.0	4.5
4.0	0.05	0.05	31st	1	—	—	—	—	23.5	2.0	—	2.5	17.0	3.5	—	—	—	2.0	1.0	5.0
0.2	91.61	6.43	14th Sept.	123	—	—	—	15	114.5	107.5	1	21.5	99.0	72.5	13.5	18.0	21.0	35.5	6.5	75.5

at Foreign Stations in the Year 1879.

Rainfall.			Weather.								Wind.										Latitude.	Longitude.			
Total.	Max.	Day.	Number of days of								No. of Observations under each Point.														
			Rain.	Snow.	Thunder-storm.	Fog.	Clear sky.	Overcast.	Gales.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm.							
31°46'	2°45'	27 Oct.	97	—	—	—	177°5	56°5	—	24°0	—	156°0	—	2°0	—	179°0	1°5	1°5	36	6	20 N.	5	20	53 W.	
26°51'	4°83'	29 Sept.	67	—	1	13	—	229°5	45°5	2°0	18°0	69°0	13°5	57°5	7°0	42°0	26°5	131°5	—	35	53	40 N.	14	30	54 E.
50°19'	7°00'	1 May	137	10	8	12	—	147°5	129°5	1°0	04°5	104°5	38°5	10°5	38°0	78°5	12°5	5°5	11°5	41	0	0 N.	20	3	0 E.
3°98'	1°18'	9 Feb.	19	—	3	3	—	49°0	11°0	2°0	19°5	11°5	4°0	6°5	6°5	11°5	5°0	24°5	—	35	0	0 N.	33	15	0 E.
2°14'	0°96'	24 June	8	1	4	4	—	96°5	4°0	—	24°0	9°0	7°0	7°0	4°0	21°5	4°5	33°0	—	25	0	0 N.	23	0	0 E.
5°47'	1°14'	21 Dec.	12	2	1	4	—	32°5	5°5	—	6°5	1°0	3°5	2°5	0°5	0°5	10°0	23°5	—	34	40	0 N.	33	0	0 E.
34°17'	2°50'	6 Feb.	122	—	—	50	—	152°5	144°5	2°0	15°5	98°5	164°0	30°5	8°0	7°0	10°0	20°5	2°0	29	3	0 S.	30	2	0 E.
20°17'	7°23'	4 Aug.	166	—	—	69	—	212	—	—	22	8°5	85°5	6°5	18°0	39°5	131°5	12°5	43°0	8	29	0 N.	13	9	0 W.
62°47'	6°50'	15 Nov.	186	—	—	—	—	290°5	35°0	—	4°5	258°0	30°0	94°0	—	1°0	—	1°5	—	13	4	30 N.	59	40	30 W.
63°47'	7°41'	7 Nov.	138	—	—	10	—	48°5	121°5	0°5	16°5	153°0	45°0	94°0	15°5	18°5	0°5	22°5	—	25	5	0 N.	77	21	0 W.
180°09'	8°80'	11 Oct.	187	—	—	17	—	132°0	80°0	3°0	4°0	10°0	144°0	119°0	11°5	4°0	9°0	—	63°0	18	62	0 N.	76	42	0 W.
79°43'	6°39'	13 Oct.	105	—	—	76	—	96°0	42°5	—	9°5	219°5	19°5	107°0	0°5	1°5	0°5	1°00	7°00	17	59	0 N.	76	56	0 W.
56°26'	2°58'	21 May	132	—	2	8	—	76°0	157	8	37°0	57°0	17°0	51°5	18°0	103°0	34°0	29°5	15°0	32	17	45 N.	64	47	0 W.
110°08'	4°32'	19 Feb.	210	—	—	38	—	116	105°5	—	—	179	—	—	—	186	—	—	—	1	16	0 N.	105	31	0 E.
91°61'	6°45'	14 Sept.	123	—	—	15	—	1114°5	167°5	1	21°5	90°0	72°5	13°5	18°0	21°0	35°5	6°5	75°5	22	16	0 N.	114	9	0 E.

* Observations from 9th November to 31st December.

§ No daily record of wind; 6 months each N.E. and S.W. monsoons.

APPENDIX No. IX.

TABLE showing the AVERAGE STRENGTH of the TROOPS at each of the PRINCIPAL STATIONS in the UNITED KINGDOM, with the ADMISSIONS into HOSPITALS for PRIMARY VENEREAL SORES, SECONDARY SYPHILIS, and GONORRHOEA respectively in each year from 1860 to 1878 inclusive.

Stations.	1860.				1861.				1862.				1863.				1864.			
	Strength.	Primary Venereal Sores.	Secondary Syphilis.	Gonorrhoea.	Strength.	Primary Venereal Sores.	Secondary Syphilis.	Gonorrhoea.	Strength.	Primary Venereal Sores.	Secondary Syphilis.	Gonorrhoea.	Strength.	Primary Venereal Sores.	Secondary Syphilis.	Gonorrhoea.	Strength.	Primary Venereal Sores.	Secondary Syphilis.	Gonorrhoea.
Devonport and Plymouth	3,825	609	125	684	3,537	703	161	623	3,426	500	182	497	2,782	344	143	354	2,481	271	52	287
Plymouth	5,710	1,073	260	1,057	5,107	851	188	1,011	4,891	608	232	839	4,530	497	246	669	4,456	338	201	578
Chatham and Sheerness	5,647	661	137	919	4,660	470	263	622	3,634	337	276	511	3,409	368	121	890	3,804	334	163	554
Woolwich	6,877	1,280	470	1,065	5,367	823	299	894	5,387	781	254	878	5,234	500	183	641	4,824	384	132	417
Aldershot	15,164	1,369	485	1,681	12,808	1,894	451	1,362	12,078	1,400	478	1,548	11,746	1,297	487	1,116	10,700	1,129	504	1,301
Windsor	3,681	476	136	386	3,758	459	88	434	3,589	234	86	389	2,905	280	67	328	2,580	298	96	231
Shorncliffe	2,668	440	68	451	2,135	281	62	350	1,479	233	62	247	1,850	241	102	289	2,089	247	72	370
Colchester	1,440	176	47	203	1,186	118	47	198	674	107	19	133	621	63	20	88	647	72	21	117
Winchester	2,405	365	94	306	2,339	353	60	132	2,054	212	69	299	2,188	215	51	325	2,214	199	42	206
Dover	1,880	155	47	237	1,593	227	65	254	1,124	119	74	247	1,079	147	68	269	1,178	80	41	204
Canterbury	492	52	13	59	412	14	12	30	271	6	7	17	289	24	4	24	216	8	14	9
Maidstone	1,848	222	49	205	1,835	217	52	218	1,408	153	29	131	1,126	108	63	92	1,070	81	38	111
Cork	5,942	1,017	221	623	5,962	863	329	686	5,007	544	176	647	6,060	615	219	477	4,505	581	205	418
Curragh	37,479	8,405	2,172	7,966	51,338	7,267	2,077	7,133	46,222	5,224	1,874	6,283	43,419	4,653	1,774	5,202	40,094	4,135	1,681	4,803
Total	124,500	22,900	3,068	2,671	22,883	2,888	747	2,322	10,781	2,121	691	2,437	20,119	2,357	507	2,177	19,987	2,455	729	2,025
Isle of Wight	1,245	111	32	163	1,164	100	40	135	800	86	17	134	1,037	50	38	125	1,118	83	35	162
London	No returns.	46	28	37	336	30	27	34	823	62	13	116	692	88	36	135	681	30	24	97
Warley	386	92	26	125	367	49	13	30	547	52	13	9	513	45	13	26	536	24	16	12
Hounslow	1,315	509	85	67	1,262	87	18	147	750	36	27	73	819	43	22	75	805	52	29	6
Pembroke Dock	1,108	135	15	130	1,118	258	61	63	573	76	25	70	626	47	20	46	567	31	6	48
Sheffield	1,183	185	17	110	1,051	185	45	192	1,031	185	45	192	1,031	96	39	117	962	100	66	12
Manchester	944	126	15	100	1,068	88	20	82	710	38	31	134	698	39	67	96	865	85	12	196
Preston	1,471	173	37	197	1,496	145	22	176	1,409	93	40	207	1,303	138	35	176	1,129	74	24	110
Edinburgh	1,666	172	19	173	1,820	117	18	145	1,204	43	30	83	1,355	87	35	122	1,425	74	29	102
Fermoy	1,257	154	11	229	1,246	150	30	157	1,064	143	27	146	910	146	18	68	783	101	25	71
Limerick	922	81	19	201	717	100	39	82	810	41	165	27	90	876	38	112	738	107	46	93
Athlone	5,423	1,009	239	708	4,800	706	235	566	4,645	577	53	715	4,622	741	106	647	4,607	825	211	464
Dublin	812	100	23	154	1,091	158	30	108	645	77	166	101	650	64	37	71	789	86	23	76
Belfast	766	164	207	209	5,757	830	214	209	4,755	621	174	397	4,387	745	193	361	5,068	806	183	389
London & Windsor combined	5,732*	766	164	207	5,757	830	214	209	4,755	621	174	397	4,387	745	193	361	5,068	806	183	389
Total	22,900	3,068	644	2,671	22,883	2,888	747	2,322	10,781	2,121	691	2,437	20,119	2,357	507	2,177	19,987	2,455	729	2,025

Stations.	1885.				1886.				1887.				1888.				1889.			
	Strength.	Primary Sores.	Secondary Syphilis.	Gonorrhoea.	Strength.	Primary Sores.	Secondary Syphilis.	Gonorrhoea.	Strength.	Primary Sores.	Secondary Syphilis.	Gonorrhoea.	Strength.	Primary Sores.	Secondary Syphilis.	Gonorrhoea.	Strength.	Primary Sores.	Secondary Syphilis.	Gonorrhoea.
Devonport and Plymouth	2,689	342	70	377	2,566	209	76	432	2,443	185	57	434	2,418	159	87	339	2,199	162	46	374
Portsmouth	4,954	546	175	683	4,510	452	197	747	4,351	504	143	782	4,928	422	133	925	4,808	289	103	588
Chatham and Sheerness	4,188	360	182	584	3,086	259	142	447	4,481	317	189	587	4,959	384	127	699	4,694	168	100	467
Woolwich	4,796	368	107	394	4,607	410	106	385	4,392	423	128	563	5,003	253	122	474	5,261	271	112	465
Aldershot	11,049	1,108	390	1,235	9,211	742	265	815	7,884	638	255	784	9,879	760	293	992	10,698	668	331	1,103
Windsor	—	—	—	—	—	—	—	—	1,074	62	—	60	1,053	143	—	66	1,035	96	30	84
Shorncliffe	2,744	187	103	266	2,404	137	50	287	2,616	111	65	338	2,654	197	112	314	2,687	163	83	271
Colchester	2,366	254	82	398	2,255	380	65	422	2,378	346	80	538	2,059	374	116	440	1,883	160	53	278
Winchester	978	71	20	202	928	43	28	137	902	47	47	116	982	92	43	152	794	80	21	104
Dover	2,387	160	46	174	2,078	186	29	217	2,014	287	96	275	2,366	262	92	428	2,433	195	100	292
Canterbury	1,090	77	24	100	931	109	45	122	961	116	23	173	1,146	131	44	241	966	43	31	130
Maidstone	344	61	13	68	375	52	12	56	384	93	13	108	483	53	10	96	443	57	13	117
Cork	1,423	122	45	126	1,768	87	37	112	1,570	113	27	119	1,443	88	41	117	1,624	119	34	131
Curragh	4,411	427	138	352	4,768	369	126	365	3,981	409	122	409	3,985	335	109	380	3,412	299	75	219
Total	43,078	4,077	1,344	4,837	39,476	3,444	1,138	4,573	39,911	3,640	1,250	5,274	42,595	3,533	1,319	5,635	42,017	2,765	1,091	4,466
Isle of Wight	1,210	39	23	190	1,220	14	16	241	1,105	65	43	132	976	101	58	145	998	120	60	185
London	—	—	—	—	—	—	—	—	4,380	715	—	—	4,353	645	—	—	4,155	597	—	—
Wexley	610	60	7	119	1,020	81	15	211	1,298	91	11	268	824	76	14	326	4,061	40	142	271
Hounslow	514	12	9	16	524	11	16	39	468	31	16	48	416	44	29	34	483	41	12	53
Pembroke Dock	419	35	9	24	746	23	4	39	968	27	9	93	1,242	44	18	104	1,055	53	3	66
Sheffield	703	68	31	89	585	63	25	75	800	130	23	247	801	86	26	123	644	94	17	83
Manchester	940	119	64	142	813	75	36	130	1,021	181	28	224	1,142	132	62	129	914	146	40	100
Preston	1,053	88	28	214	847	64	15	109	1,045	95	35	132	883	77	17	161	874	150	45	178
Edinburgh	1,175	132	16	155	1,059	61	16	86	1,024	65	22	102	1,118	51	17	91	1,055	63	18	87
Ferriby	888	39	14	40	844	30	26	43	1,077	75	14	91	867	41	13	87	872	101	19	70
Limerick	813	58	21	145	767	37	16	52	865	100	14	91	869	103	27	103	755	41	9	36
Athlone	439	66	20	67	576	24	26	31	679	58	12	70	648	21	19	53	653	23	6	62
Dublin	4,397	659	169	626	4,086	627	157	566	3,895	685	193	656	4,898	680	201	579	4,294	772	213	549
Belfast	941	43	23	164	598	44	17	51	516	46	—	36	519	29	3	123	446	23	3	—
London & Windsor combined	5,391	738	163	387	5,240	791	117	322	—	—	110	—	—	—	—	—	—	—	—	—
Total	19,482	2,156	536	2,385	19,335	1,945	598	1,985	20,559	2,372	549	2,670	19,436	2,130	719	2,296	17,739	2,273	682	1,566

Stations.	1870.				1871.				1872.				1873.				1874.			
	Strength.	Primary Venereal Sores.	Secondary Syphilis.	Gonorrhoea.	Strength.	Primary Venereal Sores.	Secondary Syphilis.	Gonorrhoea.	Strength.	Primary Venereal Sores.	Secondary Syphilis.	Gonorrhoea.	Strength.	Primary Venereal Sores.	Secondary Syphilis.	Gonorrhoea.	Strength.	Primary Venereal Sores.	Secondary Syphilis.	Gonorrhoea.
Devonport and Plymouth	2,208	85	29	982	3,900	159	49	614	2,748	161	73	421	3,036	112	59	289	2,956	108	67	182
Portsmouth	4,548	282	101	564	5,656	231	88	794	4,065	241	138	724	5,721	250	104	564	4,063	287	97	182
Chatham and Sheerness	4,115	192	74	434	4,719	300	79	659	4,474	228	134	814	4,202	172	86	334	4,257	160	90	259
Woolwich	5,569	241	88	517	5,814	384	63	754	6,257	373	87	869	6,213	370	151	600	6,206	293	155	419
Aldershot	11,235	757	370	1,053	15,493	1,011	204	1,706	12,741	795	324	1,332	11,821	852	291	1,068	12,922	664	307	900
Windsor	1,070	72	16	53	1,046	81	12	55	1,035	100	14	61	1,089	92	36	68	1,057	65	31	42
Shorncliffe	2,145	80	47	157	2,638	87	44	245	2,738	91	60	114	2,258	47	44	136	2,488	35	64	100
Colchester	1,637	70	28	214	2,231	74	74	249	2,124	117	59	306	1,873	78	32	161	1,985	34	44	106
Winchester	441	27	9	27	752	22	20	75	837	48	47	55	679	18	20	46	1,604	38	10	63
Dover	2,477	75	64	223	2,759	70	40	288	2,691	127	23	263	2,365	91	27	140	2,381	87	36	164
Canterbury	732	111	10	129	985	37	20	243	891	38	16	129	1,015	20	24	106	1,067	36	7	11
Maidstone	205	14	10	35	338	15	8	19	331	19	3	51	272	16	3	33	212	14	54	82
Canterbury	1,825	126	46	149	2,345	129	37	213	2,595	161	67	218	2,525	153	47	168	2,116	51	28	164
Cork	8,273	183	66	224	5,714	202	100	390	5,067	254	66	363	4,990	149	45	284	3,962	182	99	164
Curragh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total	41,580	2,568	996	4,081	54,080	2,763	932	6,254	50,794	2,752	1,045	5,290	48,039	2,420	989	3,946	48,136	2,039	1,074	2,968
Isle of Wight	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
London	806	68	11	94	1,147	76	29	147	1,190	68	71	102	1,128	42	23	75	1,206	107	63	142
Warley	4,204	680	97	263	4,282	657	135	363	4,708	937	210	336	4,278	790	200	381	3,696	716	177	412
Hounslow	630	33	15	68	1,073	61	32	127	711	47	25	81	963	21	7	77	941	30	23	73
Pembroke Dock	772	43	17	47	753	34	23	41	667	60	13	50	631	42	6	43	603	45	5	34
Sheffield	689	63	12	80	1,057	30	24	98	935	25	28	51	1,282	32	54	61	1,359	29	72	63
Manchester	1,084	100	54	144	1,133	79	30	153	837	82	31	154	1,028	52	32	110	801	39	22	73
Preston	558	75	16	83	916	69	30	145	944	92	27	133	1,028	103	21	115	1,053	112	20	86
Edinburgh	1,056	106	35	124	1,106	76	33	98	874	100	27	114	854	108	17	151	1,072	65	46	85
Fermoy	1,271	110	50	65	1,290	41	9	46	1,128	63	13	79	1,164	51	8	75	1,253	31	38	56
Limerick	732	21	6	57	742	42	39	70	1,062	80	10	63	907	20	8	37	768	8	8	14
Athlone	482	21	6	57	468	23	10	37	720	10	7	29	637	9	6	13	592	48	9	22
Dublin	4,495	576	103	453	4,638	545	184	675	4,914	813	161	737	4,087	629	160	560	3,946	375	138	280
Belfast	497	21	5	70	657	40	14	101	438	31	64	48	687	71	13	67	796	51	19	71
Total	17,362	2,022	555	1,723	19,957	1,865	592	2,137	19,950	2,467	694	2,113	19,801	2,025	633	1,898	18,879	1,081	644	1,450

Stations.	1875.				1876.				1877.				1878.			
	Strength.	Primary Venereal Sores.	Secondary Syphilis.	Gonorrhoea.	Strength.	Primary Venereal Sores.	Secondary Syphilis.	Gonorrhoea.	Strength.	Primary Venereal Sores.	Secondary Syphilis.	Gonorrhoea.	Strength.	Primary Venereal Sores.	Secondary Syphilis.	Gonorrhoea.
Devonport and Plymouth -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Portsmouth -	9,575	75	64	157	2,658	71	58	317	2,931	83	71	339	3,327	111	83	322
Portsmouth -	5,553	169	128	384	5,692	151	145	385	4,575	124	94	335	5,735	84	119	372
Chatham and Sheerness -	4,312	75	105	325	4,388	151	117	282	5,080	219	88	335	5,735	84	119	372
Woodwich -	3,665	330	210	302	3,785	231	178	470	6,246	179	213	305	6,704	244	318	506
Aldershot -	12,531	600	289	814	12,655	563	322	901	14,410	637	282	978	13,775	730	253	1,136
Windsor -	9,721	40	67	43	9,556	39	24	78	1,020	82	24	77	1,066	43	44	80
Shorncliffe -	2,686	48	53	80	2,748	60	47	115	2,832	92	68	117	3,314	136	90	143
Colchester -	2,248	72	53	180	2,631	80	22	130	2,502	79	42	138	2,863	53	32	202
Winchester -	957	26	10	66	983	20	16	85	1,004	18	13	119	1,129	43	21	124
Dover -	2,300	63	43	118	2,478	73	63	112	3,225	62	32	178	3,244	102	32	203
Canterbury -	1,138	14	39	76	1,408	38	19	80	1,378	26	15	107	1,460	40	13	83
Maidstone -	138	1	2	5	108	3	4	2	119	4	1	8	146	1	1	11
Cork -	2,680	57	41	101	2,620	54	42	150	2,437	39	19	90	2,430	88	32	107
Curragh -	4,258	147	90	183	4,112	76	66	205	4,554	175	90	321	5,218	280	84	397
Total -	48,696	1,717	1,195	2,825	48,620	1,622	1,121	3,392	52,422	1,809	1,090	3,651	55,813	2,235	1,222	4,352
Isle of Wight -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
London -	1,222	109	73	68	1,139	61	37	73	1,062	56	43	85	1,311	63	56	79
Warley -	3,897	730	185	373	3,735	546	170	366	3,979	604	170	398	4,246	1,060	292	640
Hounslow -	819	30	11	11	824	42	13	79	1,120	67	11	138	722	101	19	116
Pembroke Dock -	660	16	6	29	646	50	8	39	621	30	16	30	774	31	22	48
Shenfield -	1,218	38	38	45	972	28	38	47	863	14	8	56	963	12	3	44
Manchester -	779	68	23	71	812	97	21	72	1,198	157	69	80	1,199	246	29	137
Preston -	1,068	95	50	115	1,063	120	45	162	1,198	157	69	80	1,199	246	29	137
Edinburgh -	749	43	71	54	819	63	77	86	848	65	71	98	1,366	98	55	141
Fermoy -	1,222	33	13	85	1,155	103	18	86	1,122	53	43	74	1,366	98	55	141
Limerick -	1,200	15	17	39	1,182	37	36	76	886	26	23	42	684	18	24	52
Athlone -	903	23	13	29	802	38	14	41	845	63	11	79	918	78	30	96
Dublin -	818	8	22	13	603	6	33	30	700	25	24	41	760	22	38	54
Belfast -	4,267	311	276	370	4,062	510	11	459	4,131	425	156	574	5,067	779	238	639
Total -	19,573	1,532	817	1,405	18,790	1,554	745	1,077	19,076	1,730	603	2,234	20,749	2,723	873	2,508

APPENDIX No. X.

THE ALEXANDER MEMORIAL FUND.

COMMITTEE.

Sir WILLIAM M. MUIR, K.C.B., M.D., Hon. Physician to the Queen,
 Director-General, Army Medical Department, *President*.
 Sir T. GALBRAITH LOGAN, K.C.B., M.D., Hon. Physician to the Queen.
 Surgeon-General T. G. BALFOUR, M.D., F.R.S.
 Surgeon-General T. LONGMORE, Hon. Surgeon to the Queen, Professor of
 Military Surgery.
 Deputy Surgeon-General J. A. BOSTOCK, C.B., M.D., Hon. Surgeon to the
 Queen.
 Deputy Surgeon-General W. J. FYFFE, M.D.
 Surgeon-Major F. S. B. F. DE CHAUMONT, Professor of Military Hygiene.
 Inspector-General of Hospitals, R. LAWSON, M.D.
 Surgeon-General WM. RUTHERFORD, C.B., M.D.
 Surgeon-General WM. MUNRO, C.B., M.D.
 Surgeon-General Sir A. D. HOME, K.C.B., V.C.
 Surgeon-Major FREDERICK ROBINSON, M.D., Scots Guards.

At a meeting of the Committee, held at the Army Medical Department, 6, Whitehall Yard, July 9th, 1879, it was unanimously resolved that the Prize of 50*l.* and a Gold Medal of the value of 10*l.* be awarded to Surgeon J. Martin, A.M.D. (date of commission March 31st, 1874), for the best Essay "On the influence of drinking water in originating or propagating enteric fever, diarrhœa, dysentery, and cholera: to be illustrated, as far as possible by instances under the personal observation of the author."

It was also determined that the subject for the next competition should be "On the prevalence of enteric fever in the Army; its etiology, pathology, and treatment: to be illustrated by the personal observation of the author"; and that a Prize of 50*l.* and a Gold Medal of the value of 10*l.* be offered for the best Essay written thereon.

Essays to be despatched so as to reach the President of the Committee on or before the 31st December 1881.

Essays are to be legibly and clearly written, superscribed with a brief motto, and accompanied by a sealed envelope, similarly superscribed, containing the name and address of the author.

The competition to be limited to Executive Medical Officers of the Army on full-pay.

The relative merits of the Essays to be determined by Assessors to be selected by the Committee.

The Prize to be awarded to the best Essay offered, without reference to the number of competitors, provided the writer has complied with the prescribed conditions.

L O N D O N :

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For Her Majesty's Stationery Office.
[6010.—950.—8/81.]

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